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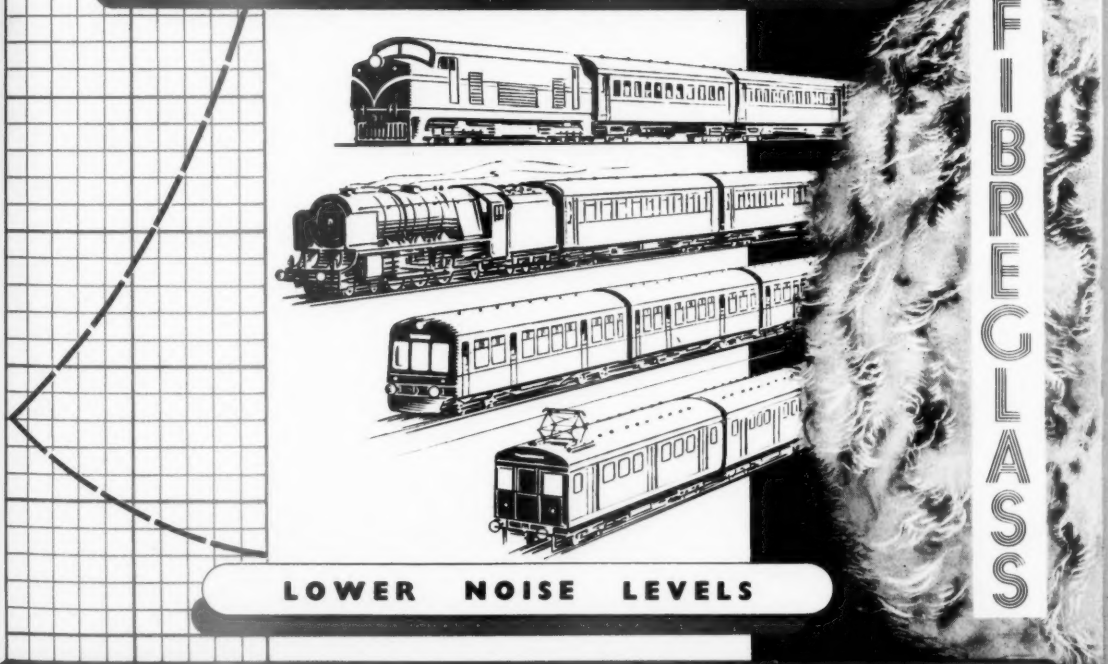

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TO OUR READERS

We regret that, because of a dispute in the printing industry, to which we are not parties and which involves matters beyond our control, it has been necessary to reduce some features in this issue. The dispute may also result in delay in delivery.

The Future of London Transport

ADAPTATION to new circumstances and action in dealing with them are the keynotes to the transport theme today, according to Sir John Elliot, Chairman of the London Transport Executive. In a farewell interview with the *London Transport Magazine* he answered questions on present and future problems of the organisation. He stressed his belief in the future of the Underground, referring to the £30 million modernisation programme now in progress and to the relationship that exists between underground railway efficiency and road congestion, which in turn affects the smooth running of London's buses. Referring to the projected Victoria line, Sir John Elliot said he was glad he had been able to make it a live issue, and that planning now was at a point at which work could start in a few months' time. He was sorry the decision to build it had not come during his Chairmanship, but he believed it would come during that of Mr. A. B. B. Valentine, who will succeed him on his retirement at the end of this month. As usual, Sir John Elliot had a word to say regarding staff problems. He believes " that transport wages ought to be high enough to attract good young men and women, but they are largely dependent on what passengers are prepared to pay for their rides. The public is the master." These are wise words, and the staff of London Transport would do well to remember them.

Analysing British Railways' Costs

AFTER the original investigations and experiments in this largely unexplored field had been carried out under headquarters guidance, traffic costing teams were set up to serve the Regions of British Railways and the Divisions of British Road Services. This Traffic Costing Service has now been extended by attaching traffic costing staff to the Line Traffic Managers and other traffic managers who have important commercial and operating responsibilities under the new organisation for the decentralisation of the management of British Railways. Costing shows that rail movement can be very economical for a distance of 20 miles or less in favourable, and quite extravagant for a 100 miles in the wrong circumstances. This is important in the light of the short distances in Britain. As regards passenger traffics the average cost per seat mile for the longer journeys by railway is much lower than the comparable road cost although the overall railway load factor is sometimes rather low. On rural and feeder passenger services, where the volume of traffic is small, Sir Brian Roberston stated that the bus service was usually cheaper though in some cases the traffic might be so thin that even a bus service could be run only at a loss. In outlining the difficulties of costing suburban traffic, he stressed that so far from paying adequately for these relatively expensive services, the travelling public were paying less than for travel at other times.

Importance of Traffic Costing

TRAFFIC costing is playing an increasingly important part now that British Railways have obtained greater freedom in charging for goods traffic. Fiercer competition for traffic has increased the importance of accurate sub-division of receipts and costs. As Sir Brian Robertson, Chairman of the British Transport Commission, explained recently to the 30th National Cost Conference of the Institute of Cost & Works Accountants, accurate costing is essential to obtain the best results from the freedom accorded by the Freight Charges Scheme of 1957. The former working by railway staff to rate books placed the railways at great disadvantage with their competitors on the road. Today the rate book is being thrown on to the scrap heap. An alternative form of guidance is needed. Again, the British Transport Commission has before the Transport Tribunal an application for greater freedom in fixing passenger fares. If this is granted, it will call for means to obtain more accurate information so that the new flexibility may be correctly used. For reasons such as these a traffic costing service has been developed in the Commission. It is achieving a standard of accuracy attained by very few other railway administrations when the very complex factors governing railway movement in Britain are taken into account.

25th Year of " Pioneer Zephyr "

IT is 25 years since the introduction of the first diesel-powered streamline train in the U.S.A., the articulated three-car stainless-steel " Pioneer Zephyr " of the Chicago, Burlington & Quincy Railroad. When this train made its record-breaking dawn-to-dusk run in 1934 from Denver to Chicago, 1,015 miles, at an average speed of 77.6 m.p.h., it initiated the use of streamline passenger equipment as the most promising means of attracting the public to train travel. On November 11 of that year it entered regular service between Lincoln, Nebraska, and Kansas City, via Omaha and St. Joseph. After a quarter of a century, including nightly journeys of 1,000 miles for over 20 years, the train is still running, making a daily round trip between Lincoln and St. Joseph. It has travelled a total distance of more than 3,000,000 miles. The " Pioneer Zephyr " was built by the Budd Company and powered by a 600-h.p. engine produced by the Electro-Motive Division of General Motors Corporation. It was the first of the Burlington Railroad's present fleet of " Zephyr " diesel trains serving major western cities. The newest is the " Denver Zephyr " which went into service in October, 1956.

Channel Tunnel Progress

ENCOURAGING news of the progress towards the construction of a tunnel under the English Channel was given by Mr. Leo d'Erlanger, Chairman of the Channel Tunnel Company at the recent annual meeting in London. He stated that the way was now clear for a civil engineering investigation. An exhaustive, and apparently encouraging review of the volume of traffic likely to use the tunnel had already been completed, and a geophysical survey was being rounded off by the sinking of boreholes in the bed of the Channel. Referring to the type of traffic that would use the tunnel, Mr. d'Erlanger thinks it unlikely that motorists will be able to drive through. Apart from the considerable difficulty of ventilating a 30-mile tunnel and of providing lay-by space for

breakdowns, calculations show that the throughput of vehicles by rail far exceeds that of road vehicles travelling under their own power. The latter proposition in his opinion, simply is not economic under present conditions. Methods are being studied for the carriage of accompanied motorcars and goods vehicles on railway transporters. The estimates of the cost of £100,000,000 for twin rail tunnels are not likely to be improved, but a shorter time of construction than the seven years indicated in 1930 might be achieved.

Completing Kitchener's Strategic Link

AT present there are two large independent metre-gauge systems in the Republic of India, the northern one, with about 10,000 route-miles, stretching from the Pakistan border near Karachi in the west to Tinsukia, in the north-eastern corner of Assam, in the east. The southern system runs from Manmad, east of Bombay, down to the extreme southern tip of the peninsula. Though less than 200 miles apart at one point, these two systems have not hitherto been connected. This is the more curious because a link between them was first suggested in 1882 and in 1903 the Commander-in-Chief in India, Lord Kitchener, strongly urged physical metre-gauge connection between the two systems for strategic reasons. The railways themselves have also had strong reasons for their connection, not only on economic grounds but also to enable a free interchange of rolling stock between them. The recent rapid rise in traffic has at last reinforced these arguments and the Khandwa-Hingoli link between the two systems is now under construction as described briefly in an article on another page.

Rail-Road Developments

VERY many of the strenuous efforts being made today to improve the service given by railways to the public are not new either in the ideas behind them or the techniques adopted, though the techniques today have the equipment made available by modern resources. Piggy-back, for example, is at least 90 years old, but door-to-door or rail-road traffic is considerably older. It goes back to the very beginning of public railways, for on the Surrey Iron Railway, with flanged rails, vehicles could be turned off at many points on to the roadways or into the fields to reach their final destination. This was before the evolution of railways into common carriers with only their own motive power and rolling stock allowed to run over the track. The road-rail concept was swept aside by Stephenson's development of the locomotive with flanges on the wheels. Co-incidently with Stephenson, the Austrian Ritter von Baader was laying down the principles for combined rail-and-road traffic, of which, unfortunately, little notice was taken. Yet, as Dr. Mravlag, head of road transport section of the Austrian Federal Railways, shows elsewhere in this issue, the modern conceptions of rail-and-road traffic, in particular the large transporters for carrying fully-laden railway wagons and other special loads over the highways, are a resuscitation of the 150-year-old ideas.

North-Eastern Region Summer Timetables

MAIN-LINE changes in the North Eastern Region summer timetable, apart from the usual seasonal additions to the service, are relatively few. The 7 a.m. from Newcastle to Edinburgh, working the first class sleeping car off the 11.55 p.m. from Kings Cross to Newcastle, calls additionally at Dunbar. Last summer's 12.30 a.m. Newcastle-Glasgow relief train this year starts at 1 a.m., and reaches Glasgow at 4.20 instead of 3.57 a.m. The northbound " Queen of Scots " Pullman starts from Leeds at 3.27 p.m. as now, but is accelerated to reach Glasgow at 8.55 p.m., 10 min. earlier.

Among internal changes, the introduction of more diesel multiple-units permits accelerations of certain trains between Hull and Scarborough. An innovation on Saturdays this summer is an hourly diesel multiple-unit service, leaving the Manors station at Newcastle at 20 min. past the hour from 8.20 a.m. to 8.20 p.m. (and with two later trains), for Newsham, Bedlington and Newbiggin, with corresponding hourly trains in the reverse direction. Another novelty on Saturdays from July 11 to August 15 will be an express at 9 a.m. from Newcastle to Carlisle and Stranraer Harbour, arriving at 1.40 p.m. to connect with the 2.20 p.m. steamer to Larne on the days when the latter sails. The return service will be at 12.17 p.m. from Stranraer Harbour, due Newcastle at 4.53 p.m.

During the past winter a diesel multiple-unit service at systematic times was introduced between both Leeds and Bradford and Ilkley, and the summer timetable reveals the complete transformation that has been effected. Between Bradford and Ilkley the former seven trains have now become 19 each way daily, with running times reduced from 36 to 31 min. Large gaps in the service have been filled in.

In our previous reviews of this summer's timetables, we have commented on some of the results of changes in Regional boundaries. Among such is the inclusion in the North Eastern Region book of both the former L.M.S. routes between Manchester and Leeds, and also that between Manchester Victoria and Wakefield. These also still appear in the current London Midland book, but with a significant difference. The L.M.R. Manchester-Wakefield table, though appearing to be complete, deliberately omits all trains whose journeys are confined to the North Eastern Region side of the " frontier," such as the locals between Sowerby Bridge and Wakefield or the diesel trains run between Huddersfield and Wakefield to connect with the Eastern Region expresses to and from London. This is surely misleading. If the L.M.R. continues to print these tables in its book, they should be complete; otherwise the omissions should be made clear.

Evanescence of Freight Train Traffic

(*By a correspondent*)

THE appalling decline in railway freight train traffic and receipts this year justifies the heading of this article. It was bad enough when tonnage and receipts declined by 9 per cent in the first 12 weeks. In four weeks to April 19 traffic decreased by 13 per cent and receipts by 14 per cent. Worse was to come, for revenue fell by £3,356,000, or nearly 15 per cent, in four weeks to May 17 and pointed to another sharp drop in carryings. These comparisons are made with 1958, a lean year when British Railways lost 9,059,000 tons of their 1957 freight train traffic in 20 weeks to May 18, with a decrease in revenue of over £7 million. The position of our railways is indeed precarious.

An alarming feature of the statistics for four weeks to April 19 was the decrease in coal class traffic of 1,804,000 tons, or 14 per cent, involving a reduction in receipts of £1,748,000, or 17.5 per cent. A larger fall of £2,101,000 in coal class dues—more than a fifth of last year's receipts—occurred in four weeks to May 17, foreshadowing another sharp drop in wagon loadings. These decreases reflect the downward trends of coal output and coal consumption. In the first 19 weeks of this year the National Coal Board produced 3.5 per cent less coal than in 1958 and over the whole of last year output was 3.5 per cent below the 1957 level. These recurring decreases are a serious concern to the railways because in recent times coal accounted for 44 per cent of freight receipts and merchandise, which once brought in 47 per cent of revenue, now produces 37 per cent.

The recession in freight business since 1957 has hurt every Region of our railways, but hits the North Eastern and Scottish worst of all. In the first 16 weeks of 1958 these Regions fared better than the other four; in the same period of 1959 they both lost 13 per cent of last year's tonnage and worked 13 per cent fewer ton-miles. The North Eastern originated 2,471,000 fewer tons and moved 112,037,000 fewer ton-miles; in Scotland 1,445,000 tons of traffic were lost and ton-miles were down 72,814,000. The Eastern Region had the easiest passage forwarding 58,000 more tons of merchandise and 34,000 more tons of minerals, though the loss of 518,000 tons of coal lowered total tonnage by 3 per cent. The Eastern also worked 3,642,000 more mineral ton-miles, so that the total decrease in its output was 67,330,000 ton-miles, or 5.3 per cent, compared with an all-line fall of 495,001,000 ton-miles, or 8 per cent. The London Midland Region had a decrease of 8 per cent in both originating traffic and movement, while the Western lost over 10 per cent of tonnage, but worked only 5.5 per cent fewer ton-miles, merchandise ton-miles actually increasing by 1,314,000. This is a gloomy record and unhappily No. 5 of *Transport Statistics* cannot be expected to give a brighter account of freight operations during four weeks to May 17.

THE SCRAP HEAP

Mistaken Identity

Sir Brian Robertson, Chairman of the British Transport Commission, speaking at the luncheon to inaugurate phase 1 of the Kent Coast electrification scheme, held at the Winter Gardens, Margate, on June 9, stated that he had always had a great affection for the former London, Chatham & Dover Railway ever since he stepped off a train at Chatham Station, 45 years ago, and handed his bag to a newly-commissioned Petty Officer of the Royal Navy in mistake for a porter.

Railway Development in Indo-China (1899)

It would appear that bureaucracy, the bane of the French colonies, is extending its roots in Indo-China. . . . A loan of 200 million francs has been voted by the French Chamber for the construction of railways and it seems that the French mean to lose no time in exploiting their Indo-Chinese territory. One railway is evidently proposed to menace our interests in Yunnan—*From "The Financial Times" of June* 3, 1899.

Railway Nationalisation in France

A writer in a French magazine draws attention to the unfavourable working of the State Railways in France as compared with that of the great private companies. The article is of importance, as the question of nationalising the French railway system has long been under consideration. A Parliamentary Committee has discussed the subject—*From "The Financial Times," of May* 27, 1899.

Over 3,000,000 Miles in 25 Years

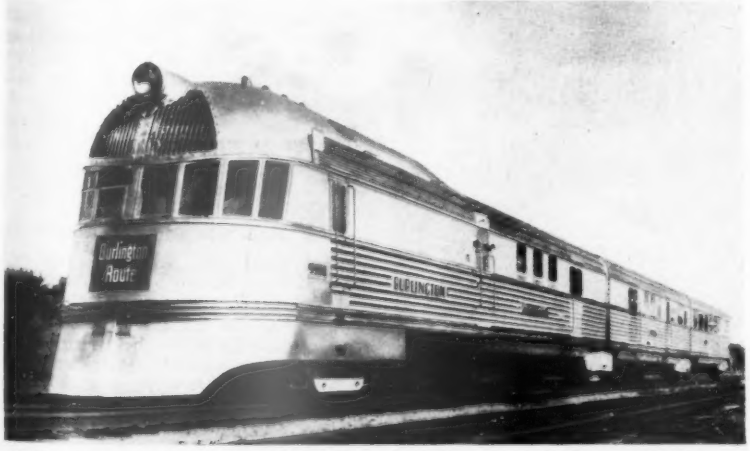
In 1934, on its record-breaking non-stop run of 1,015 miles from Denver to Chicago, in 13 hr. 5 min., the "Pioneer Zephyr" stainless-steel train of the Chicago, Burlington & Quincy Railroad, showed for the first time in the U.S.A. that a diesel-powered articulated unit could maintain a consistently high speed with safety and economy. The speeds reached were as high as 112.5 m.p.h. to achieve the average of 77.6 m.p.h.

During the spring and summer of the same year, the "Pioneer Zephyr" was visited by more than 2,000,000 people in an exhibition tour around the U.S.A. Subsequently, a regular service between Lincoln, Nebraska, and Kansas City was begun on November 11, 1934. Now the train has travelled a total distance of more than 3,000,000 miles and still is in service, making a return journey daily between Lincoln and St. Joseph on its original route. Construction was by the Budd Company, and there is one 600-h.p. G.M. diesel engine.

"A4" Pacific locomotive hauling Stephenson Locomotive Society special from Doncaster to King's Cross passing site of original Greenwood signalbox. New Hadley Wood South Tunnel on left. 111 *m.p.h. was attained on this run*

Coniston Railway Centenary

The Coniston Railway, from Broughton to Coniston, 8¾ miles, was opened for passengers on June 18, 1859. It was worked by the Furness Railway. At the half-yearly meeting of the Furness Railway on February 25, 1859, it was stated that the Lady of the Manor of Coniston and the lessees of the Coniston Copper Mines had taken shares in the Coniston Railway to the extent of £10,000, on which a dividend of not more than 2½ per cent per annum was to be paid. If the revenues of the Coniston Railway did not admit of this preferential dividend, the Furness Railway was bound to make up the deficiency. The F.R. was also authorised by the Coniston Act to take shares in the Coniston line to the extent of £10,000, which had been taken accordingly. At the half-yearly meeting of the Furness Railway, reported in *The Railway Times* of August 27, 1859, the opening of the Coniston Railway on June 18 was recorded, and it was stated that a large number of passengers had already been carried, but that the accommodation for goods and minerals would not be completed for some months.



Still running after over 3,000,000 *miles, the record-breaking "Pioneer Zephyr" diesel-powered streamline train of* 1934

"I-cumen in"

When hedgerows tell the story of the glory that is June
And the cuckoo gets a wobble in the thing he calls his tune,
When stations smell so fresh and clean the first thing in the morning
And relief-men hither-thither, with a modicum of warning,
When rolling-stock departments sometimes feel a little nervous
And everything that runs on wheels is commandeered for service,
When Mum and Dad and family again seek pastures new
And travel on the roads is just one everlasting queue,
When Ascot follows Epsom and so on, throughout the season
And transport chiefs consider there's an all-sufficient reason
For a bit of wishful thinking, when it seemed all hope had fled
Of ever getting anywhere but deeper in the red,
You can bet your bottom dollar (and it wouldn't be a sin)
That, unless we've all been cheated, summer *is* I-cumen in !

A.B.

OVERSEAS RAILWAY AFFAIRS

(From Our Correspondents)

VICTORIA

Passenger Stock Construction

Twenty saloon-type passenger carriages are to be constructed by the Victorian Railways at Newport Workshops. Their estimated cost will be £680,000. Materials are being ordered to enable the carriage construction programme to be commenced as early as practicable. The carriages, 10 first and a similar number of second class, will progressively replace existing country passenger vehicles that have reached the end of their economic life. The first class will accommodate 56 passengers and the second class 70.

The latest batch of saloon-type carriages will supplement the present air-conditioned passenger rolling stock construction programme, which provided for 10 first class and 10 second class saloon-type carriages. So far, five of each class of these have been completed, and all 20 are expected to be in service by the end of March, next year.

WESTERN AUSTRALIA

Reduced Rates for Cars by Train

The freight charge on rail passengers' motorcars, utilities, and parcel vans railed from the Metropolitan Area to Kalgoorlie, a distance of 380 miles, has been reduced from £23 10s. to £10. This reduction has been made in an endeavour to utilise rail wagons which are now being sent empty to Kalgoorlie for return traffic. The reduction, therefore, applies to the eastward journey only.

Provided two days' notice is given, arrangements are made for the motor vehicles to be available to passengers on their arrival at Kalgoorlie. Throughout transit of Interstate passengers' cars between Perth and the Eastern States is also arranged. Railway transhippers drive the cars from W.A. wagons on to Commonwealth Railway wagons at Kalgoorlie.

In the last three months nearly 300 motorcars have been transported by rail between Kalgoorlie, Western Australia, and Port Pirie, South Australia, the cars travelling on the same train as the owner and being available for use immediately on arrival. This method of transit obviates the long drive over the sparsely occupied Nullarbor Plain and desert country between the settled areas of Western and South Australia.

CANADA

C.N.R. Discussion Groups

More than 1,500 stewards, porters, chefs, cooks, waiters and other employees of Canadian National Railways sleeping, dining, and parlour car department in five centres across Canada—Montreal, Halifax, Toronto, Winnipeg, and Vancouver—got together for two days last month to learn about recent railway innovations and offer suggestions to railway management for new types of service. This was the first time that the department had conducted an employee-management conference by the group discussion method. In two morning sessions in each city, the employees conducted their own discussions on common problems and had the opportunity to suggest to management how services to the public could be made more attractive.

After the brief assembly, the men divided into groups according to their work, dining or sleeping car service, for discussion periods directed by district chairmen. Employees' ideas were passed on to management by the group leaders. In the afternoon, films associated with employee training were shown to supervisory officers.

BRAZIL

Rio Grande Do Sul Incorporation

The V.F. Rio Grande do Sul has been incorporated in Rede Ferroviaria Federal under an agreement between the Minister of Communications and the State Government. The agreement provides for re-equipping the railway to permit rapid handling of wheat, rice and other crops. The Rio Grande Do Sul Railway, 2,241 miles long, is Brazil's third longest railway. It links up with the Parana-Santa Catarina Railway at Marcellino Ramos, traverses the State in all directions, and extends to the frontiers of Santa Catarina, Argentina, and Uruguay. It was leased to Rio Grande do Sul by the Federal Union, is of metre gauge throughout, has 370 locomotives, 322 passenger coaches, and 4,830 freight wagons. Revenue amounted to 987 million cruzeiros in 1957 and expenditure to 2,683 million, of which 63.54 per cent represented staff payments.

FRANCE

Palletisation at Lille-St.-Sauveur

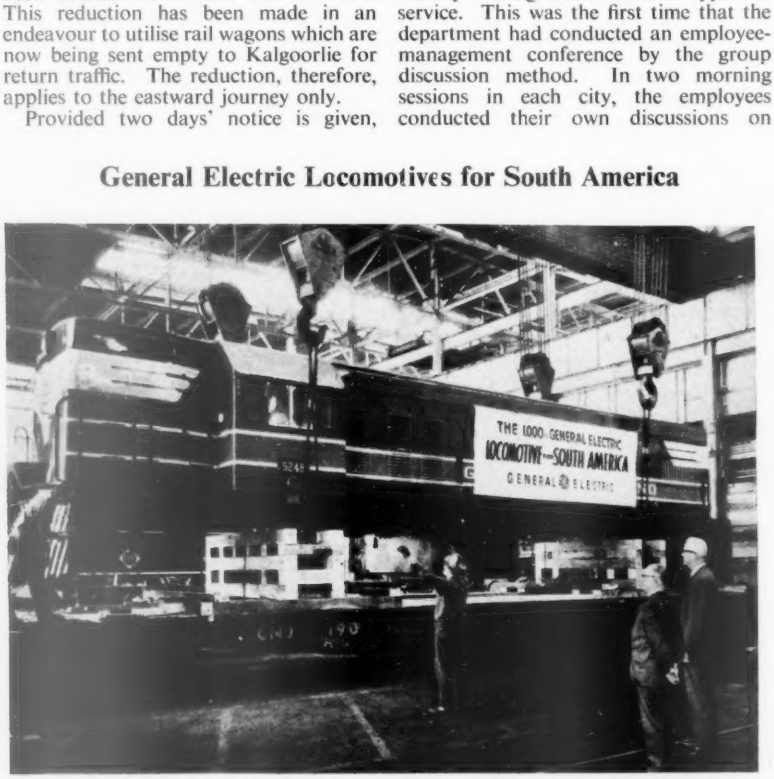
The goods station at Lille-St.-Sauveur handles daily 200-250 tons of smalls and about 2,000 parcels from local consignors, also 35-40 wagons of transhipment traffic. Since early 1957 the handling of the local traffic has been largely mechanised and palletised, present-day traffic including the despatch of 14,000 to 15,000 pallets a month. Local traffic is handled and sorted internally with the aid of roller conveyors and mobile trucks, after which packages are loaded on to pallets for appropriate destinations, the pallets being put into wagons by fork-lift trucks.

HUNGARY

Axle Inspection by Supersonic Sound

Inspection of axles by supersonic sound is to be extended to more repair shops of the State Railways. The cost of the special equipment used will be met within three months of installation by the elimination of losses caused by the old method of inspection by wheel removal. At the Dunakesz Repair Shop, where the method was first introduced two months ago, a saving of 200,000 forints (about £6,000) has already been made.

General Electric Locomotives for South America



The 1,000th International General Electric Company locomotive to be shipped to South America. It is a 1,320 h.p. 90-ton diesel-electric unit for the General Belgrano Railway, Argentina

Door-to-Door Traffic: The Link Between Road and Rail

The transport of railway wagons over roads

By Dr.-Ing. G. Mravlag, Chief of Road Services Department, Austrian Federal Railways

Four-wheel wagon on solid-tyred Culemeyer transporter

THE idea of using vehicles which could work on rails as well as on roads dates back to the days of the first railroads. In the 12th century, wooden tracks were laid in the iron-ore mines in the German Hartz mountains. In the 16th century, vehicles with flange-less wheels, running on wooden rails, were used in the Hungarian coal mines. A common feature of these vehicles was that, on leaving the rails, they were able to continue on the road. This working already contained the germ of the idea of combined road-and-rail transport. During the years that followed, attempts were made in different countries to put this principle into practice. Thus, at the beginning of the 19th century, Trevithick was credited with the idea of building road buses which were also able to run on rails. But it was only in the 20th century that the idea finally came to be realised.

The reason for this long delay is the fact that, during the 19th century, the roads were generally in such a poor condition that they could not be used for long-distance traffic but only for local and feeder traffic, and the railways had to be regarded as the only international means of transport. Only during the first third of the 20th century did development of the combustion engine, in conjunction with the invention of pneumatic tyres, result in a decisive change in the scope of road traffic.

Early Proposal for Road-Rail Vehicle

How much the idea of door-to-door traffic with road-rail vehicles had been in the minds of engineers, even at the time when the steam-worked railway was introduced, is obvious from a book by a mining engineer of that time, Ritter von Baader, entitled *Neues System der fortschaffenden Mechanik*. In this book, Baader advocated a railway system of his own invention which, in contrast with the English conception of exclusively rail-borne vehicles, was to permit traffic with road-rail vehicles. He expressed the opinion that this system was economically superior to the English system. He came forward with several different designs, and consistently emphasised the need for goods wagons which could move on the road as well as on rails.

When railways were still a rarity, he postulated that the road vehicles which then carried the bulk of all long-distance traffic, should be able to use the railway over certain sections. By virtue of these considerations, Baader must be regarded as the father of the idea of door-to-door traffic by rail and road. The vehicles of his design could have been used on rails as well as on roads, because the wheels were not provided with flanges and the function of flanges was assigned to horizontal guide rollers. But before arriving at this design, Baader had the idea of carrying railway wagons on large-size road vehicles. He must thus also be regarded as the father of the idea of modern wagon-transporter traffic, which is based on the same principle.

Tempting as that idea was, it proved to be impracticable at the time, as vehicle manufacturers were unable to solve this problem. Even so, the idea of door-to-door road-rail traffic of whole wagonloads without transhipment became lodged in people's minds to an ever-increasing extent. This is shown in the many designs for vehicles equipped with wheels and other devices for optional use on rail and road.

A common feature of all these designs was the attempt to equip a road vehicle for running on rails, or a rail vehicle for running on roads, by providing them alternatively with railway wheels or road wheels. But all these vehicles had to be specially designed and equipped for such optional use.

The devices used for this purpose can be divided into seven categories, using either wheels which were exchanged at the point of transition from rail to road, or flanged railway wheels fitted on either side of tyred wheels running on the rails or rubber-tyred road wheels eccentrically arranged and hinged down for running on roads, or railway wheels hinged down for running on rails.

All these devices had the important drawback that the vehicles became heavier, costlier, and more sensitive in operation, so that, because of the road conditions, the payload had to be reduced. This fact alone is sufficient proof that all these systems were unsuited for the road transport of normal goods wagons. This task could, and can, only be fulfilled by self-contained vehicles or chassis

Locomotive on 40-ton capacity transporter. Note position for weight distribution

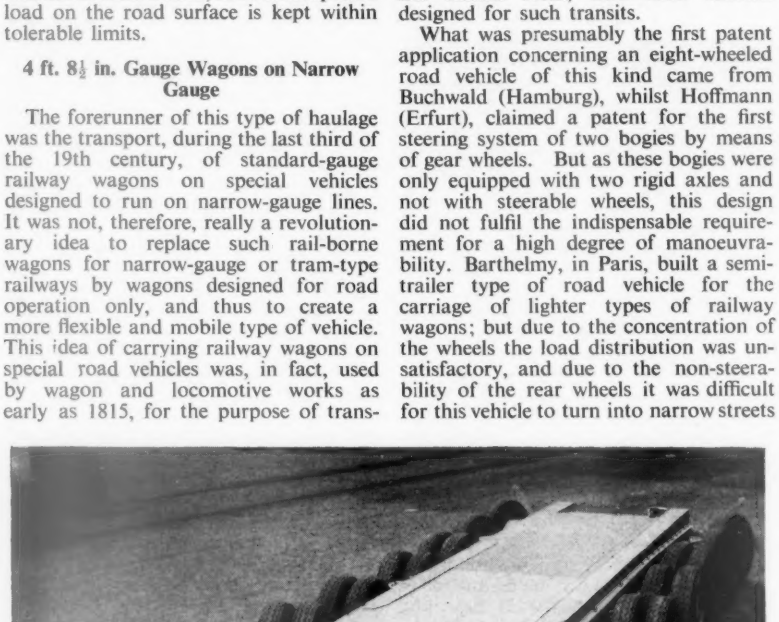
which are able to carry railway wagons without modification, and where the heavy load of the railway wagon is spread over a correspondingly great number of road wheels, so that the specific load on the road surface is kept within tolerable limits.

4 ft. 8½ in. Gauge Wagons on Narrow Gauge

The forerunner of this type of haulage was the transport, during the last third of the 19th century, of standard-gauge railway wagons on special vehicles designed to run on narrow-gauge lines. It was not, therefore, really a revolutionary idea to replace such rail-borne wagons for narrow-gauge or tram-type railways by wagons designed for road operation only, and thus to create a more flexible and mobile type of vehicle. This idea of carrying railway wagons on special road vehicles was, in fact, used by wagon and locomotive works as early as 1815, for the purpose of transferring their vehicles to the railways. A note and illustration in *The Railway Gazette* of November 27, 1936, recalls that, as long ago as 1872, the Russian Postal Administration regularly conveyed railway mail vans between the railway station and the post office by means of road transporters, though no fewer than 30 pairs of horses were required for this purpose. What was presumably the first instance of conveying a four-axled railway vehicle on two road vehicles occurred in 1914 when the German railways so transported a railway coach to an exhibition site at Stuttgart.

Despite these attempts, the road-rail carriage of general freight was still far off. The idea of carrying whole railway wagons on suitably designed road transporters to the consignee's doorstep again became topical when, soon after the war of 1914-18, the railways began to suffer great losses due to the increasing competition of road vehicles. It was only through such combined road and rail transport that the double transhipment of the goods could be avoided and the cost of delivery reduced. In 1934, Professor Dr.-Ing. Culemeyer listed 12 German, two French, one English and one Italian inventions which were concerned, in a more or less similar form, with road vehicles designed for such transits.

What was presumably the first patent application concerning an eight-wheeled road vehicle of this kind came from Buchwald (Hamburg), whilst Hoffmann (Erfurt), claimed a patent for the first steering system of two bogies by means of gear wheels. But as these bogies were only equipped with two rigid axles and not with steerable wheels, this design did not fulfil the indispensable requirement for a high degree of manoeuvrability. Barthelmy, in Paris, built a semi-trailer type of road vehicle for the carriage of lighter types of railway wagons; but due to the concentration of the wheels the load distribution was unsatisfactory, and due to the non-steerability of the rear wheels it was difficult for this vehicle to turn into narrow streets or drives. Marston, in England, also built semi-trailers, using a Scammell tractor, but the size and weight of these trailers were such that they were not suitable for regular traffic.



Latest type of SEAG pneumatic-tyred transporter

Telescopic Vehicles

Since 1931, the German railways have developed telescopic vehicles in two sections, as well as undivided vehicles with continuous platforms. As far as the latter type is concerned, the Italian State Railways have adopted a similar arrangement for their road transporter. The essential difference between the design of the German Federal Railway and that of the Italian State Railways is that, with the latter, the springing has been deliberately left out, as it was thought that the springing of the railway vehicle, aided by that afforded by the cellular pneumatic tyres of the road transporter, would be adequate. Moreover, in contrast to the German design, the Italian transporter is not fitted with swinging axles, so that it is not possible to compensate major irregularities in the ground. On unloaded journeys, the damping provided by the tyres is even smaller, so that the vehicles sway to and fro. These vehicles can only take railway wagons with wheelbases up to 7 m. (23 ft.) Also due to their rather primitive steering system by means of tie rods for the first set of wheels and Gall's chains for the other wheels, their speed must not exceed 6 km.p.h. (3.5 m.p.h.), because even the slightest extension of the chain will impair the geometry of the steering to such an extent that a correct anti-symmetric slewing of the other set of wheels becomes impossible.

With divided transporters, conforming to Ritter von Baader's basic idea, a number of different designs have been developed, e.g., by Joukoff (Holland), Henneking (Germany), Barthelmy (France) and Culemeyer (Germany). The three first-named designs are based on the use of bogies of the kind well known on railways. When used on roads, however, these bogies have the disadvantage that they tend to run straight, even on curves.

All these conversion wagons have other features which render them unsuitable for road operation: (1) Owing to the comparatively small number of track wheels, the wheel pressures exerted on the road are too high; (2) because of the compact design of the vehicle, the number of wheels must be increased; (3) the conversion wagons are generally un-sprung, but even if they were sprung, they cannot adequately adapt themselves to the irregularities of the road surface.

Barthelmy, in France, used a greater number of wheels fitted on swinging axles, so that the specific wheel pressures were reduced and the vehicle was better able to adapt itself to the irregularities of the road surface. But the steering mechanism cannot be regarded as satisfactory, as the two trucks are cross-linked by steering rods so that the distance between truck centres, and thus the wheelbase of the railway wagon, is fixed. On sharp bends, however, the trucks tend to come closer to each other so that the steering rods are liable to break.

Culemeyer Transporters

These facts show that the only vehicles suitable as road transporters are those without such trucks. Recognition of this fact led Culemeyer and the Gotha'er Maschinenfabrik to develop the type of vehicles which are now generally known on the Continent as "Culemeyers." With these vehicles, the wheels of the railway wagon are carried on two low and short bogies fitted with two parallel U-shaped rail girders at track gauge distance (each carrying one wagon wheel), and on two half-axles able to swing in a vertical plane. Each half-axle is carried by two rubber-tyred steerable wheels. In addition, the rail sections below the half-axles can be lowered by means of hydraulic devices so that, at full load, the ramping height can be reduced from 560 to 330 mm. (22 in. to 13 in.).

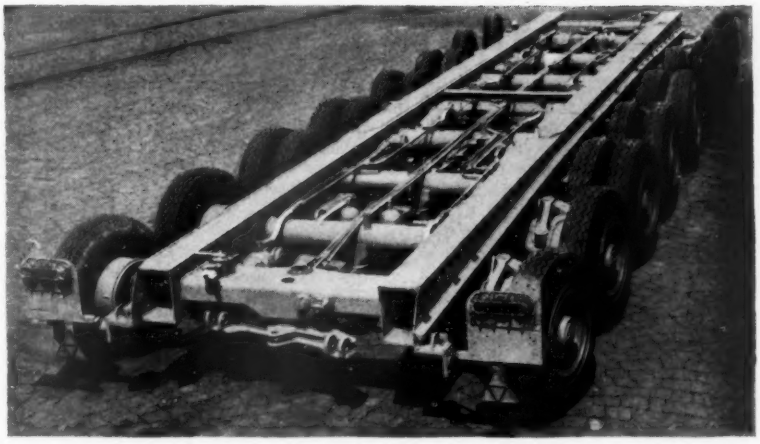
When running, the two half-units of this vehicle are securely linked by means of a telescopic steering rod, and are so steered by the tow bars that all the

wheels make anti-symmetric movements, no matter whether the two halves are short-coupled or long-coupled. The vehicle is braked by a combined oil pressure and pneumatic brake which acts on all the eight wheels of one half-unit. In addition, a mechanical hand brake is provided. The deadweight of each half-unit is 8 tons so that, with a payload of 32 tons, each of the 16 wheels has to carry a load of 2½ tons.

The springing consists of the elasticity of the tyres, the springs of the half-units, and those of the railway wagon. With road surface irregularities up to 300 mm. (12 in.) between two wheel supports, the load is equalised by the effect of the universal joints of the swinging axles and the vertical freedom of movement in their suspension. The operation of this divided vehicle still had certain drawbacks as regards handling time, minimum floor height, and the securing of the wagon on the transporter. As a result, an undivided road transporter with continuous platform was designed. With this type, the rail height was reduced to 440 mm. (17¼ in.), and the methods of handling and securing the railway wagon were simplified.

Although these transporters brought important advantages, they still suffered from two disadvantages: (1) The length of railway wagons which they could carry was limited; and (2) increase in weight of the vehicle because of the larger platform. In order to overcome these disadvantages when carrying large vehicles, such as four-axle railway wagons, or locomotives, use is now made of two undivided or two divided transporters, according to the weight of the payload, the second transporter being steered by hand.

Such measures have made possible conveyance of loads of almost incredible weight. Cases in point are the transport, by the German Federal Railway, of a generator weighing 180 tons from Basle to Nancy, or the transport by the Road Services Department of the Austrian Federal Railways across the Phyrn Pass, which has gradients of 1 in 4½, of one-half of a furnace (24 tons) for steel production at the plant of the Alpine Montan-Gesellschaft, Donawitz, Austria.

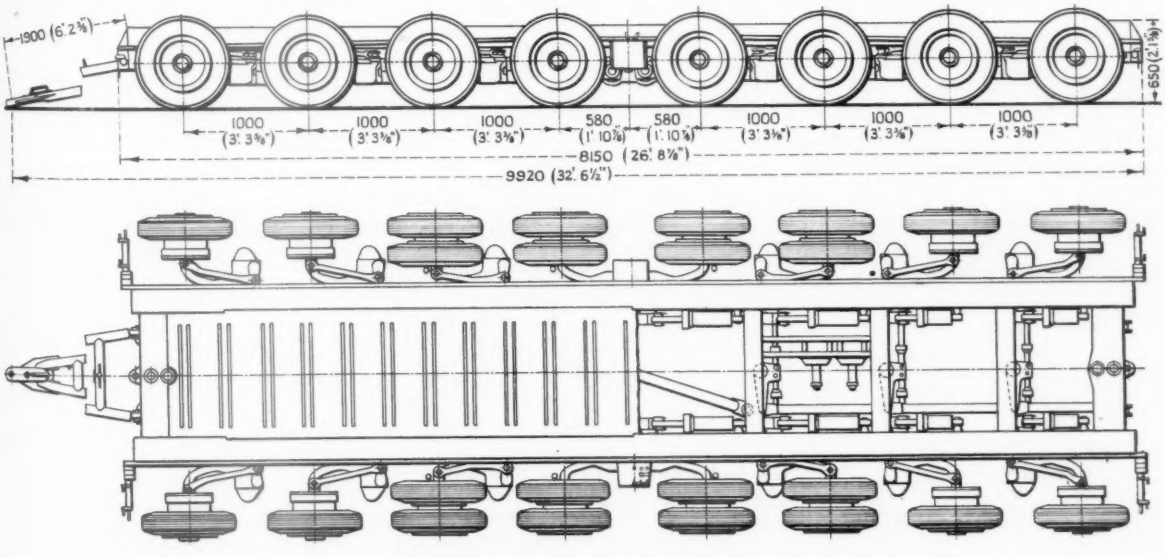


SEAG transporter without deck plate

Other consignments have included transformers, locomotives, and whole ships which were conveyed over roads from the manufacturers to the points where they were used. With such transport, the difficulties lie not only in dimensions and weight, but also in negotiating narrow streets through villages, in the condition and width of the roads, curves and gradients, as well as seaons.

Despite the wide range of facilities for the transport of heavy and ultra-heavy loads offered by these Culemeyer transporters, which are mainly used in Germany and Austria, they still have two drawbacks. First, because of the heavy loads to be carried, the leaf springs must be very amply rated. When running *without* load, however, this has the disadvantage that the transporter will begin to "jump" when passing over roadway irregularities even at low speed, and will not follow in the track of the tractor. Second, owing to the great width of the transporter (3.10 metres (10 ft.) which is 70 cm. (27½ in.) in excess of the trailer width of 2.40 metres (7 ft. 4 in.) normally permissible in Austria), a special permit is required for every trip, even when running empty.

In these circumstances, and because the production of Culemeyer transporters had ceased after World War II, Rheinstahl Siegener Eisenbahnbedarf A.G. (SEAG) has developed in conjunction with the German Federal Railway and Maschinen- und Waggonbau G.m.b.H., Donauwörth, a new design of road transporter which was intended to avoid all the drawbacks hitherto experienced with the Culemeyer transporter. In addition, it was necessary to satisfy even more exacting requirements concerning steering, springing, braking, adjustability of mounting height, and external dimensions.



SEAG transporter of 40 tons capacity on empty weight of 8½ tons. Springing is hydraulic-pneumatic. Only half the deck plate is shown

The most important requirement that had to be met was the springing. This was a problem that could not be solved by any means known up to that time, as the spring rating was determined by the maximum load to be carried. No matter whether leaf springs, coil springs or torsion-bar spring suspension were provided, the springs had to be rated for maximum load, so that when the transporter was running without load, the springing was exceedingly stiff and the running very poor.

Only through resorting to the novel pneumatic-hydraulic springing developed by SEAG was it possible to obtain almost equally good springing at full load and without load. In spite of the use of solid elastic rubber tyres, vehicles of this type have been enabled to attain running speeds of 40 km.p.h. (25 m.p.h.) without difficulty. With pneumatic tyres, they can even run at speeds of over 50 km.p.h. (30 m.p.h.) without hunting.

With the introduction of this pneumatic-hydraulic springing system, it became possible at the same time to adjust the ramping height, so that the need for expensive transfer ramps at stations and in factory yards has been obviated. Through replacing the swinging axles of the Culemeyer transporter by crank axles, the tyres rest evenly on the road, independent of the load and springing, and the slewing of the wheels cannot give rise to faulty steering.

With the latest type of SEAG transporter the maximum width has been reduced to 2.5 metres (8 ft. 3 in.). The load is spread over 16 crank axles, 12 of which are steered. The eight axles in the centre have twin tyres; the remaining axles have single-tyred wheels. The specific load on each pneumatic tyre is no more than 2.5 tons. As all the wheels can be braked by means of a combined oil-pressure and pneumatic installation, it is possible to obtain a mean retardation of 3.5 metres (11 ft.) per sec. per sec. Experience with these new SEAG-type transporters so far gathered by the German and Austrian Railways shows clearly that the problem has been correctly approached, and even points the way to further applications.

Growth of Transporter Traffic

A comparison of transporter traffic in France and in Austria clearly shows in the adjacent table the progress experienced in this type of traffic, and with two different designs of transporters. As far as Austria is concerned, the development of this type of traffic is not by any means exhausted. In fact, even during the current year, two further services of this kind have been instituted which are designed to regain a greater number of clients to the railway.

These few examples may be regarded as a proof that the road transporter has by now become an indispensable link between railway and consignee, and one which will continue to play its part not only in the immediate future but also over a longer period. One must not forget that for economic reasons many undertakings prefer road-transporter operation to the construction of a private siding. This is because, in the former case, they merely have to pay a charge per wagon conveyed to them (the empty wagon is collected free of charge), whilst the cost of a private siding includes, in addition to a wagon charge, the construction and maintenance cost of the siding.

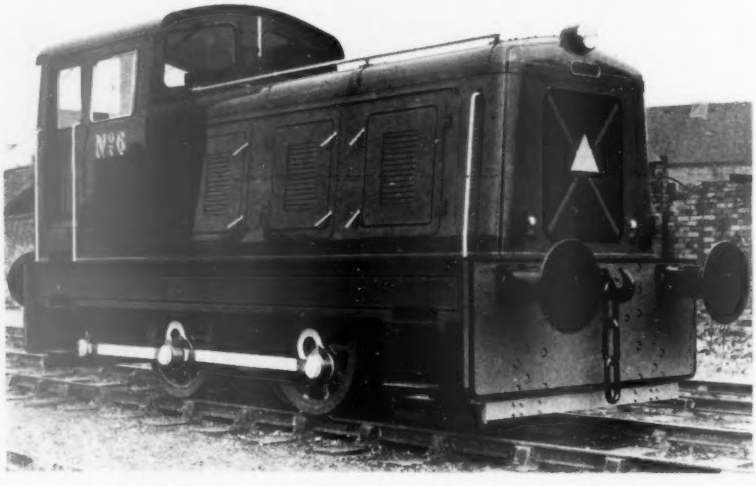
Year	France		Austria	
	Tons	Number of Transporters	Tons	Number of Transporters
1947	13,000	2	48,600	2
1948	60,000	7	75,000	7
1949	97,000	9	99,500	7
1950	150,000	12	118,300	11
1951	210,000	16	144,700	11
1952	250,000	19	147,000	14
1953	260,000	25	140,000	15
1954	260,000	28	150,900	17
1955	320,000	28	192,400	17
1956	264,000	28	218,500	19
1957	200,000	22	245,400	19
1958	—	—	247,500	24

Light 204-h.p. Diesel-Mechanical Works Locomotive

31-ton 4-ft. 8½-in. gauge design with eight-cylinder engine and four-speed epicyclic gearbox

A 31-TON diesel-mechanical 0-4-0 shunter has been supplied by E. E. Baguley Limited to Bass, Radcliffe, & Gratton Limited for work at the brewery at Burton-on-Trent. The power unit is an eight-cylinder Gardner diesel engine, type 8L3, rated at 204 h.p. at 1,200 r.p.m. C.A.V. electric starting equipment is fitted. Bolted to the engine is a size 23 Fluidrive traction type coupling, connected by a Layrub cardan shaft to the four-speed air-operated epicyclic gearbox, S.C.G. type CA4. The gear ratios are 4.07, 2.33, 1.55 and 1 : 1. The reverse and final drive unit is an S.C.G. type R.F.11.

The vertical radiator, thermostatically controlled and fitted with an engine driven fan, is carried on Silentbloc mountings. A fuel tank of 150 gal. capacity is mounted forward of the cab, under the engine casing. The Burgess silencer is mounted over the engine.



Baguley 31-ton diesel-mechanical works locomotive

Duplicated Driving Positions

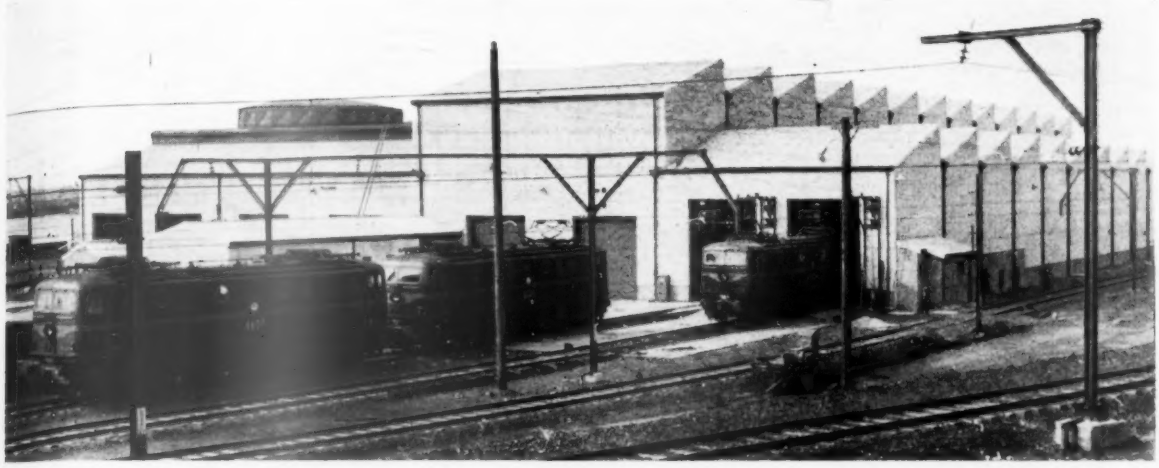
The fully enclosed full width cab provides good visibility, the front and rear buffers being visible from either of the duplicated driving positions at each side. The control equipment is housed in a steel cubicle, the top of which forms a flat top desk on which the operating levers for engine speed, gearchange, reverse, and air brake are positioned.

On the facia panel are the air pressure gauges, speedometer, engine tachometer, battery charge ammeter, and warning lights for low oil pressure and high water temperature. At the side of each tip-up seat is a sliding window, fixed windows being fitted in the cab doors. Electric windscreen wipers are fitted at the front and rear screens. The Clayton cab heater operates from the cooling water circuit. A hand-operated air pump is fitted for the emergency charging of the control air receiver.

The Westinghouse air brakes, controlled by the self-lapping driver's valve, are supplied by a type E.25 compressor, belt-driven from the engine.

Enfield Locomotive Depot, N.S.W.G.R.

Servicing and maintenance of 60 electric and 100 diesel-electric locomotives



General view from the north west of the locomotive depot showing Co-Co type electric locomotives on tracks 7 and 8 after sanding and re-filling

THE depot at Enfield, Sydney, brought into use last year by the New South Wales Government Railways, was designed to accommodate 60 electric and 100 diesel-electric locomotives. All the electric locomotives are large Co-Co machines; and of the 54 diesel-electric locomotives currently handled, 42 are of 1,750 b.h.p. or more.

Attention was paid to elimination of soot and dust and to the planning of servicing and maintenance facilities to minimise the time spent by motive power units in the depots. Enfield is perhaps somewhat unusual in that while it is not equipped to carry out locomotive heavy repairs it is equipped to deal with heavy maintenance approximating to intermediate overhauls as well as the daily servicing and routine maintenance.

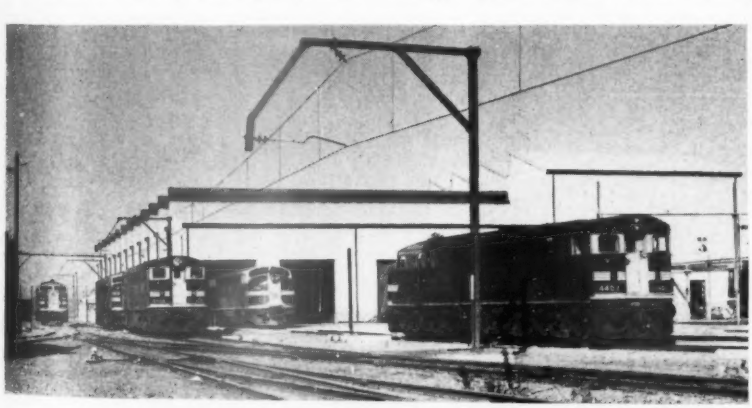
The site is north-east of the Enfield marshalling yards, and occupies 40 acres. Preliminary work involved excavation of 230,000 cu. yd. of material from cuttings to a depth of 20 ft., levelling depressed areas up to 15 ft. in depth, and provision for pits, drainage, and foundations for buildings. All locomotives enter the new depot from traffic at the northern end. The incoming track divides into three tracks, two for diesel-electric and the other for electric locomotives.

On all these tracks the units can be sanded from two overhead bins, each of 11 tons capacity. From the bins the sand can be delivered at three different levels: at the hood, side of frames, and bogies, to meet the requirements of the different types of locomotive.

Fuelling

The arrangements on these tracks enable the diesel-electric locomotives to be fuelled while being sanded. Four locomotives can be fuelled at the one time from two 250,000-gal. tanks, which together hold approximately one month's supply.

From the tanks the fuel is pumped through special filters to the fuelling points before being supplied to the locomotive fuel tanks. The latter, which have a capacity of 1,000-1,500 gal. receive the fuel at 80 gal. per min.



Diesel-electric locomotives at northern entrance to servicing track no. 1 and occupying the by-pass and outgoing tracks

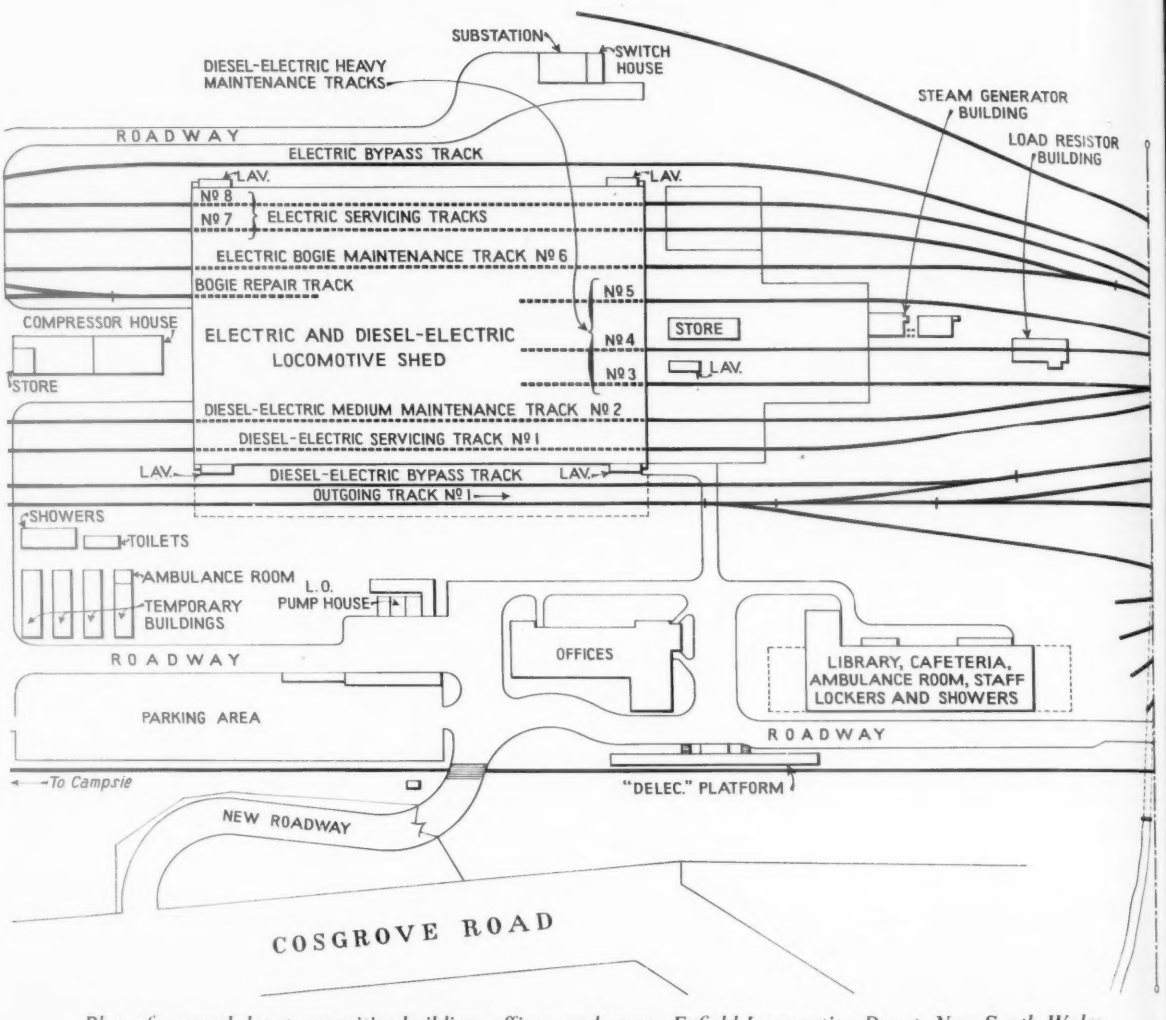
Service Shed

After leaving the sanding and fuelling tracks the locomotives are taken to the service shed. It is a steel and fibro structure 325 ft. long and 197½ ft. wide, with a brick wall to a height of 4 ft. above working level.

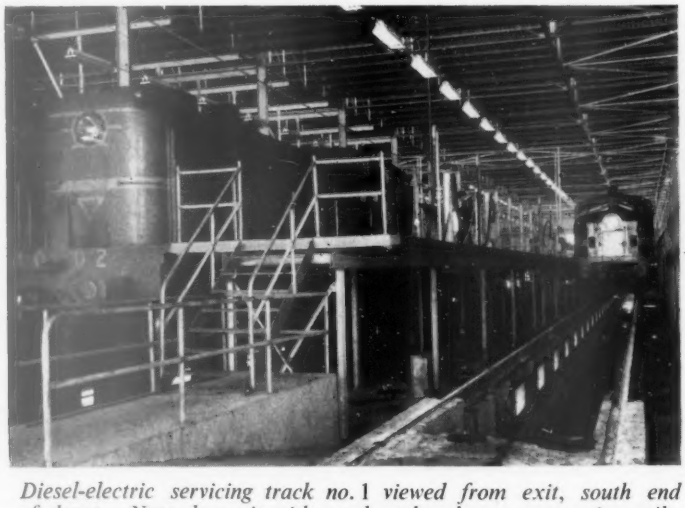
Eight tracks enter the service shed. Two are equipped with overhead wiring for electric locomotives. Tracks 1 and 2 are used for diesel locomotive servicing and for light and medium maintenance work. Tracks 3, 4, and 5 are short stub tracks extending for 100 ft. inside the building, and are used for heavy diesel-locomotive maintenance. Track No. 6 is for the maintenance of electric locomotive bogies, and is at floor level and without any elevated platform. Jacking strips are provided on the floor level at each side to permit lifting by hydraulic jacks. A 20 h.p. capstan also is installed to tow dead bogies along track 6. A crossover outside the far end of the building connects this track, with a bogie storage track, which is itself extended back into the shed to form a drop-pit release road. Track 6 is wired to within 40 ft. of the outside of the building, but is not wired inside. It is tracks 7 and 8 that are assigned to electric locomotive maintenance; and they are wired right through, and are protected by isolating switches.

Injection Room Pressurised

In the area bounded by the bogie repair track, the three stub tracks, and track No. 2, are situated the fuel injection room, which is slightly pressurised; the diesel store; the electrical store; tool room, filter-cleaning room, with



Plan of covered depot, amenities building, offices, and so on, Enfield Locomotive Depot, New South Wales Government Railways



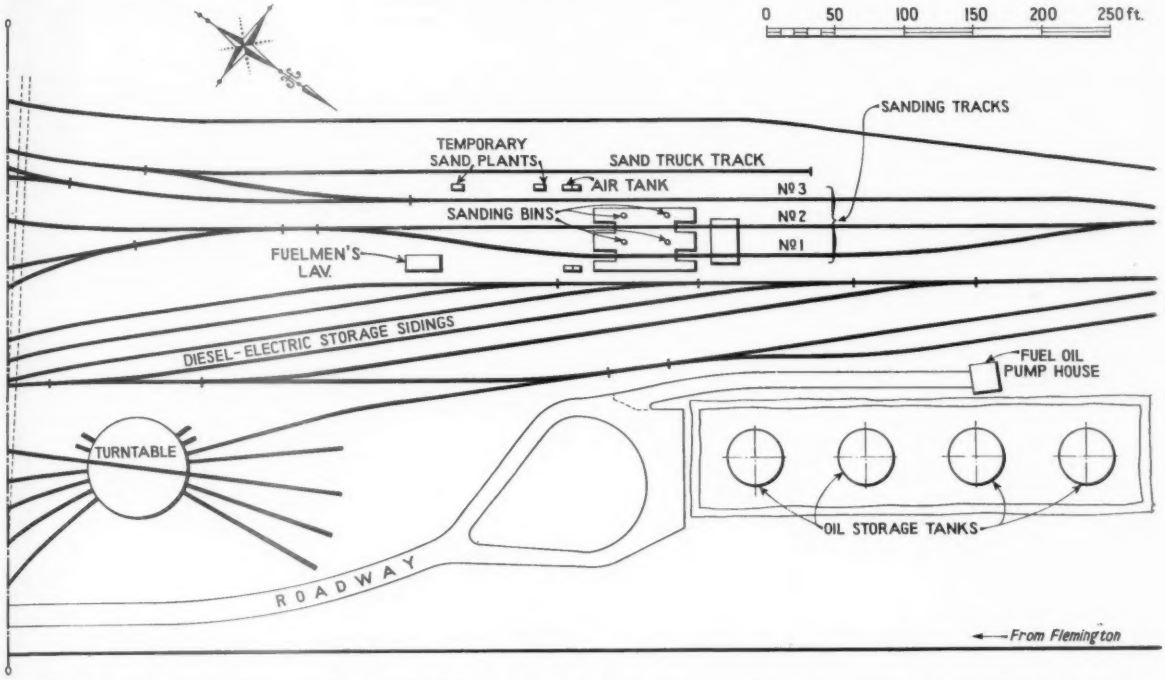
Diesel-electric servicing track no. 1 viewed from exit, south end of depot. Note deep pit with steel stub columns supporting rails, and platform shared with medium maintenance track on left

Electric locomotive over pit, showing shadowless lighting. Rails for tracks 7 and 8 insulated to prevent electrolysis in reinforced concrete

Paxton-Mitchell machine, parts cleaning room, electrical sub-foreman's office and storeman's office. Beside No. 6 track is a heavy storage area and engine reconditioning space; and under the tool room is a basement bulk store.

lighting is by shadowless fluorescent tubes, and some of these are mounted in the walls of the inspection pits and between the track-supporting stub columns. Low-voltage wandering leads can also be plugged in at various points down

Fuel-oil pumps	Thompsons (Castlemaine) Limited The Day Pump & Engineering Pty. Limited
Kent meters for fuel and lubricating oil	Gilbert & Barker Co. Ltd.
Flexible swivel joints for fuel handling	H. P. Gregory & Co. Ltd.



Plan of entrance roads at northern end of depot showing location of sanding bins, storage tanks and pump house. Turntable is only needed for diesel-electric locomotives

The covered depot has been built to facilitate quick and efficient inspection, cleaning, servicing and maintenance. Three floor levels provide simultaneous convenient access to the various parts of locomotives. Inspection pits are formed by reinforced-concrete side walls supported on reinforced-concrete rafts making the floor of the pit. Longitudinal timbers resting on the pit side walls carry the 107 lb. running rails on tracks 6, 7 and 8; on the remaining roads the track rails are supported on steel stub columns at 4 ft. centres. On tracks used by diesel-electric locomotives the distance from pit floor to railhead is 5 ft., and from the outside floor to the railhead 2 ft. 9 in.

Shallow Pits for Electric Locomotives

Pit depth on electric locomotive tracks is only 4 ft., and height from outer floor level to railhead 12 in. Elevated platforms are provided to assist inspection and maintenance; they are 5 ft. above floor level at the diesel tracks and 4 ft. 10 in. alongside the electric locomotive tracks. Tracks 7 and 8 throughout, and track 6 in the washing-down area are insulated to prevent electrolysis damaging the reinforcement in the concrete or causing shorts.

Power Supply

A sub-station outside the main building takes current at 11 kV. and converts it down to commercial voltages. Internal

each pit. Roof ventilators of heat-valve form are mounted on the roof ridge poles to draw out the diesel fumes; and wind currents are used to induce greater movement of the heated air from the building passing to the atmosphere.

Equipment includes a 40-ton overhead crane and a 50-ton pit jack, and lubricating oil supply equipment. Oil is drawn from 6,000-gal. bulk storage tanks. Each locomotive has a capacity for about 200 gal. of lubricating oil. The used oil is extracted, pumped to storage tanks, and later taken to the oil reclamation plant at Clyde.

Storage Area

After being passed through the service shed the locomotives are taken to the storage area. The track layout provides for them to by-pass the service building when required.

At the storage area a 75-ft. turntable has been provided for single-ended diesel-electric locomotives ready for despatch as soon as they are needed.

The amenities building includes a library, cafeteria, an ambulance room, and lockers and showers for the staff.

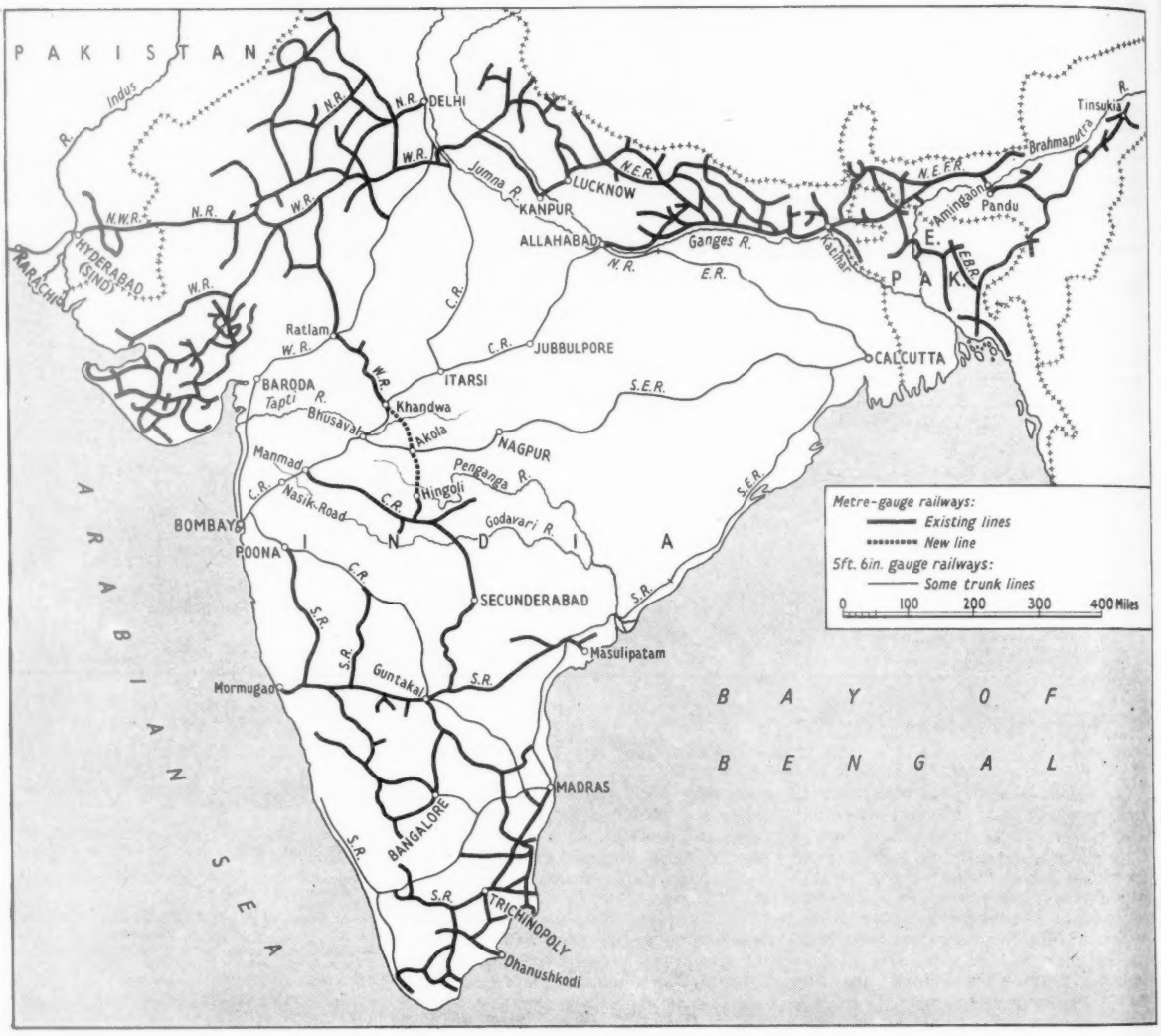
The following were the principal contractors for the buildings and equipment :

Building and concreting...	Stuart Bros., Pty. Ltd.
Steel	Sydney Steel Co. Pty. Ltd.
Roof ventilators ...	The Swartwout Company
Rust prevention in tanks	Dimet Pty. Limited
Fuel-oil storage tanks ...	Harry Simpson & Co. Pty. Ltd.
Clayton steam generator and Hydro - steam cleaning spray	Westeels Industries Limited
Lub.-oil pumps	Ebsray Pty. Limited
Aja dip cleaning tanks ...	Magnus Chemical Company
Paxton Mitchell filter washing and oiling machines	Knox, Schlapp & Co. Ltd.
Spirax air and steam traps	Bells Asbestos & Engineering Limited
40-ton travelling crane ...	A. E. Goodwin Limited
Prest-Air compressors ...	Perkins Australia Pty. Limited
Whiting drop table ...	Gibson Battle & Co. Ltd.

New Track Recording Coach for British Railways.—A new track recording coach has been developed for British Railways as part of the modernisation programme. It is the only one of its kind ever built. The vehicle can pinpoint and record the smallest of irregularities in rail track, and will be an aid to railway engineers in making better use of manpower and materials for track maintenance. By a system of electrical measurements the coach verifies and records on a moving chart the width between rails, the regularity of track curvature, and, by relating axle movement to a high-speed gyroscope, whether curved lines are banked to exactly the right angle for express speeds. The measurements are taken at speeds of up to 30 m.p.h., the track bearing the load of the 24 ton vehicle as it moves along. The coach was developed by Elliott Brothers (London) Limited, one of the companies in the Elliott-Automation Group, in conjunction with the British Transport Commission Research & Development Engineers. The vehicle required to carry the measuring and recording equipment was designed and built by D. Wickham & Co. Ltd.

Linking the Two Indian Metre-gauge Systems

Construction of the Khandwa—Hingoli line through difficult country



The northern and southern metre-gauge systems of India, showing the Khandwa-Hingoli link

THE metre-gauge railways in India at present are grouped in two separate systems. The route-mileage of the northern system is about 10,000 and that of the southern system some 4,900. Between them is a 187-mile gap, between Khandwa to the north and Hingoli to the south. In March, 1954, the construction of a line to close this gap was begun.

From Khandwa hitherto the terminus of the Western Railway metre-gauge line from Rutlam, Indore and Mhow, and also located on the Central Railway 5 ft. 6 in. gauge main line from Bombay to Delhi and Calcutta, the new line rises from 1,007 ft. to 1,250 ft. above sea level in the initial 27 miles, to cross the first ridge of the Satpura Range. Deep cuttings and high embankments were necessary on this section, which is followed by a descent to the Tapti River. This is crossed by a bridge of seven spans, and is about 1,000 ft. long.

The route then winds through mountainous country known as the Melghat of the Satpuras, on steep hillsides and sharp S curves. At one point there is a complete spiral. Deep rock cuttings, high embankments, major bridges and viaducts, and two tunnels with a combined length of half a mile are necessary. The line rises to a summit at Talai, 1,610 ft. above sea level, and then drops to cross the Purna River, between Akot and Akola, on a seven-span bridge 1,050 ft. long with pier well-foundations sunk to over 50 ft. below river bed. At Akola the Bhusaval-Nagpur broad-gauge main line of the Central Railway is crossed, and before reaching Hingoli the rivers Chandrabhaga and Penganga are also crossed. Hingoli is the terminus of a branch from Purna on the Central Railway Manmad-Secunderabad metre-gauge line.

In all there will be about 50 major and 500 minor bridges and culverts in the course of 187 miles. Already 33 miles from Khandwa and 18 miles from Hingoli have been opened for traffic and the whole line is expected to be completed in 1961. The estimated cost is £9,290,000.

Results of North-South Link

With its completion, through running will be possible from Tinsukia in north-east Assam, from the Punjab in the north, and from Sind, in Western Pakistan, to Dhanushkodi in the extreme south of the sub-continent. An important advantage will be the ability to transfer motive power and rolling stock as necessitated by traffic demands.

RAILWAY NEWS SECTION

PERSONAL

Mr. H. D. Singh, Director, Railway Stores, Indian Railway Board's Office, has been appointed Senior Deputy General Manager, Eastern Railway of India.

We regret to record the death on June 6, in Lisbon, at the age of 66, of Mr. A. T. Holman, Chairman of Holman Brothers Limited.

We regret to record the death on June 2, at the age of 72, of Mr. E. S. Huntingford, Chairman of Air Pumps Limited.

We regret to record the death on June 7, in Montreal, at the age of 80, of Mr. George A. Walker, Chairman of the Canadian Pacific Railway, 1948-55.

Lord Teynham has been appointed a director of the Transport Development Group.

Mr. V. Venkataramayya, Engineer-in-Chief (Construction), South Eastern Railway of India, has been appointed Chief Engineer. He succeeds Mr. P. C. Neogi, who, as recorded in our May 29 issue, has been appointed Director-General Research Design & Standardisation, Indian Railway Board.

Mr. J. F. M. Zoutendyk, Resident Engineer, South African Railways, has been elected a member of the Institution of Civil Engineers.

Mr. R. B. Temple, Traffic Manager, Sheffield, Eastern Region, British Railways, will retire at the end of this year. He will be succeeded by Mr. E. R. Williams, District Commercial Officer, Sheffield.

Mr. A. E. Jenner, Assistant Manager, Piggyback Services, Canadian Pacific Railway, has been appointed Manager, Piggyback Services. He succeeds Mr. R. E. H. Wilkes, who has retired.

Mr. H. Solomons and Mrs. D. Bolton have been appointed members of the Transport Users' Consultative Committee for the London Area. They will represent labour and local authorities respectively.

Mr. C. C. M. Wall has been appointed Secretary, Metropolitan Railway Country Estates Limited. He succeeds Mr. W. F. Johnson, who has resigned because of ill health. Mr. Wall continues as Group Accountant to the company and its subsidiaries.

Mr. A. G. Jones, formerly Director and General Manager, Broom & Wade Limited, has been appointed Managing Director Guy Motors Limited, from July 1. He succeeds Colonel A. Jerrett, who has retired for health reasons.

THE INSTITUTION OF CIVIL ENGINEERS

The following names have been entered on, or transferred in, the register of the Institution of Civil Engineers :

Members :

Mr. A. F. Chapman, Harbour Engineer's Office, Poole, Dorset.

Mr. A. B. A. Rida, Chief Engineer, Sudan Railways.

Associate Members :

Mr. A. J. Cooper, Assistant Engineer, Chief Civil Engineer's Office, King's Cross, Eastern Region, British Railways.

Mr. F. X. A. L. D'Souza, Sir William Halcrow & Partners.

We regret to record the death on June 2, at the age of 33, of Mr. Leonard Whynes, Senior Chemist, Levington Research Station, Fisons Limited.

We regret to record the death on June 3, at the age of 80, of Colonel C. J. H. Watson, formerly Stores Superintendent of the London & South Western Railway and later of the Southern Railway.

THE LATE SIR ARCHIBALD BOYD

A memorial service to the late Sir Archibald J. Boyd, Chairman of the Metropolitan-Cammell Carriage & Wagon Co. Ltd., 1956-59, was held at St. Margaret's, Westminster, on June 10. Reference to the service is made elsewhere in this issue.

Mr. K. D. Rhodes, Organisation and Methods Assistant, Paddington, Western Region, British Railways, has been appointed District Engineer, Cardiff.

Sir Gilmour Jenkins, who recently retired as Permanent Secretary to the Ministry of Transport & Civil Aviation, has joined the board of G. K. N. Reinforcements Limited, a member of the Guest Keen & Nettlefolds group.

Mr. M. A. Rao, Senior Deputy General Manager, Eastern Railway, India, has been appointed Principal of the Railway Staff College, Baroda. He will take up his new appointment on completion of his present leave.

Mr. J. Busfield has been appointed a director of Crofts Engineers (Holdings), Limited, Crofts (Engineers) Limited and J. Parkinson & Son (Shipley) Ltd. Mr. T. J. Goff, Joint Managing Director, Crofts (Engineers) Limited and a Director of Crofts Engineers (Holdings) Limited, has also been appointed a director of J. Parkinson & Son (Shipley) Ltd.

Birthday Honours

The following is a selection of Birthday Honours of transport and industrial interest :

Barons

Sir John Forster, President of the Industrial Court.

Sir Patrick Spens, M.P. for South Kensington, and Director, 1941-43, Southern Railway.

Baronet

Major Sir Harold Bibby, Chairman, Bibby Line and Member of the Mersey Docks & Harbour Board.

Knights Bachelor

Mr. L. C. Gamage, Chairman & Managing Director, General Electric Co. Ltd.

Mr. G. Pollock, Director, British Employers' Confederation.

Mr. K. H. Preston, Chairman, Stone-Platt Industries Limited.

C.B.

Mr. J. E. Hampson, Deputy Secretary, Ministry of Transport & Civil Aviation.

C.M.G.

Mr. M. H. Varvil, Permanent Secretary Ministry of Transport, Federation of Nigeria

C.B.E.

Mr. R. W. F. T. Berkley, Director & General Manager, Belfast Steamship Co. Ltd.

Mr. R. W. Cook, Head of Shipping Department, Crown Agents for Oversea Governments & Administrations.

Mr. N. McCusker, Commissioner for Railways, New South Wales.

Mr. A. T. Gandell, General Manager, New Zealand Government Railways.

Mr. G. W. Quick Smith, Adviser (Special Projects), British Transport Commission.

O.B.E.

Mr. F. L. H. Bascom, Senior Engineer, Crown Agents for Oversea Governments & Administrations.

Mr. P. H. Hicks, Assistant Chief Engineer (Construction), East African Railways & Harbours Administration.

Mr. W. L. Ives, Principal Traffic Officer, British Transport Waterways.

Mr. T. O'Leary, National Secretary, Docks Group, Transport & General Workers' Union.

Mr. H. F. S. Rickerby, Senior Chief Executive Officer, Ministry of Transport & Civil Aviation.

Mr. C. S. Robertson, District Superintendent, Bulawayo, Rhodesia Railways.

Mr. W. A. I. Thorn, Deputy Director, Telecommunications, Ministry of Transport & Civil Aviation.

Mr. J. T. Turbayne, General Manager, British Travel Association, U.S.A.

M.B.E.

Mr. E. Berry, Deputy Manager, Contracts Department, Vickers-Armstrong Limited.

Mr. D. Cameron-Douglas, Senior Investigating Officer, Ministry of Transport & Civil Aviation.

Mr. E. C. Cookson, Assistant Civil Engineer, Western Region, British Railways.

Mr. M. T. Corrigan, Executive Officer, Ministry of Transport & Civil Aviation.

Mr. C. Donald, Main Grade Engineer, Ministry of Transport & Civil Aviation.

Mr. G. Duckworth, Traffic Manager, Southdown Motor Services Limited.

Mr. R. R. Galloway, Senior Survey Clerk, West of Scotland District, Ministry of Transport & Civil Aviation.

Mr. H. Harvey, Acting Fire Superintendent, East African Railways & Harbours Administration.

Mr. G. W. Hill, Superintendent, Marine Engineering, Associated Humber Lines Limited.

Mr. R. J. Liddle, Rhodesia Railways representative in Elizabethville.

Mr. B. Pringle, Manager of Motor Engineers, British Thomson-Houston Co. Ltd.

Mr. T. G. Sinclair, Higher Executive Officer, Ministry of Transport & Civil Aviation.

Mr. L. Sproat, Operating Officer, North Eastern Region, British Railways.

Mr. N. B. Thomas, Engineer, Crown Agents for Oversea Governments & Administrations.

Mr. L. A. Wynn, Assistant Works Manager, Ministry of Works & Transport, Western Region, Nigeria.

B.E.M.

Mr. L. J. Abbott, Inspector, Commercial Department, Western Region, British Railways.

Mr. W. J. R. Brett, Inspector, Special Class, Category B, Waterloo, Southern Region, British Railways.

Mr. Alikade Musoke, Stationmaster, Mityana, Uganda, East African Railways & Harbours Administration.

Mr. F. J. Pambala, telephone operator, Limbe, Nyasaland Railways.

Mr. W. J. Sage, Permanent Way Inspector, Stratford, Eastern Region, British Railways.

Mr. A. W. E. Wright, Lairage Foreman, Fishguard, Western Region, British Railways.

XUM

NEW EQUIPMENT AND PROCESSES

Cold Bend Testing Machine

A MOTOR-DRIVEN cold bend testing machine is available which is suitable for bending iron or steel bars up to 2 in. square or plates up to 6 in.wide.

The specimen to be tested is bent to a maximum angle of 180 deg. round a centre pin, five standard sizes of pins being used. The pusher pin, which is mounted on a cast-steel table, is readily adjusted in relation to the centre pin so that a perfectly round bend may be obtained. A graduated scale round the moving table allows the angle of bend to be noted during testing. The load is applied by a 5 h.p. motor through a worm-gear reduction to the table. Heavy steel plate and wire-mesh guards protect the operator during the test.

This machine is built under licence from the Tinius Olsen Testing Machine Company, Philadelphia, U.S.A. Sole agent in Great Britain and Eire is Edward G. Herbert Limited, Atlas Works, Levenshulme, Manchester 19, from which company further details can be obtained.

Double Insulation Industrial Machines

THE DI-K2c¼ in. general-duty drill, DI-K12c¼ in. low-speed drill and DI-K3c ⅜in. general-duty drill, are claimed to be the first British double insulated industrial machines. The double insulation is achieved by a second, independant barrier of insulation between current-carrying parts and outer casing. Bodies and handles have been completely lined, the switch cover is of toughened glass fibre, and an insulating sleeve is built between armature shaft and windings. The ventilation fan is moulded from plastic and the entry bush and cleat made from nylon. The insulation of every unit leaving the works is finally tested at 4,000V.

With double insulation an earth wire is unnecessary and all machines for export will be fitted with a two-core cable. For this country, in accordance with factory regulations, a three-core cable is fitted. The machines comply with International Regulations and carry the International Sign for Double Insulation.

Accessories include a drill stand for converting drill to drill press, angle drilling attachments, and bench clamp stand. The drills are T.V.-suppressed and radio suppressors can be fitted if required. Power is from Universal motor (T.V. suppressed) for operation on 100/111, 110/130, 150/160, 200/220 and 220/250V. d.c. and single-phase a.c. 25/60-cycle, also for 50V. to special order.

Further details can be obtained from the manufacturer, Wolf Electric Tools Limited, Pioneer Works, Hanger Lane, London, W.5.

Platform Trucks

GREATER upright strength and added protection for the fingers is claimed for the new "Flagship" range of tubular steel platform trucks.

Platforms are in nominal seasoned timber, framework is of British steel tube. Standard fittings include aluminium die-cast rubber-tyre wheels.

Double-decker models have a detachable shelf in ¾ in. nominal softwood. Supporting angle runners create no obstruction when the base platform only is required for use. Slatted uprights can be provided.

Prices range from £9 15s. to £20 10s. according to size and type. Further details can be obtained from the Angel Truck Co. Ltd., Meteor Works, 215-219, Albion Road, Stoke Newington, London, N.16.

Heat in Cold Storage

MODIFIED "Panelec" floor heating has been installed in a - 20 deg. F. cold store to counteract falling temperature of the underlying subsoil which could cause "heave" and foundation displacement.

The protection mat has been incorporated in a 1½-in. screed laid beneath the insulation under each floor. Loads in the freezing and break-up rooms are respectively 123.75kW. and 12.75kW.

Further details can be obtained from British Insulated Callender's Cables Limited (Panelec Heating Division), 21 Bloomsbury Street, London, W.C.1.

Fluid Hose Coupling

A NEW quick release fluid hose coupling is being British-manufactured under licence from the Binks Manufacturing Company of America.

The coupling is compact, hard-wearing, and its push-and-turn operation is simple, quick and foolproof. Its principal advantages are that it enables the operator to make a rapid change of colours and that the gun can be disconnected for cleaning without the necessity of "blowing back" or cleaning out fluid lines.

The basic unit comprises an E.62 body assembly, with an E.60 ⅜ in. B.S.P.T. stem assembly. An alternative stem assembly, the E.61 ⅜ in. x 20 T.P.I., is available. A fluid hose connector is supplied with the complete coupling. Price, complete, is £1 8s. 0d., plus 20 per cent. Delivery is ex-stock.

Further details can be obtained from the British manufacturer, Alfred Bullows & Sons, Limited, Long Street, Walsall, Staffs.

Exterior Area Lighting

A NEW series of exterior area lighting fittings for use with the manufacturer's 80/125/250W. MBF/U mercury fluorescent lamps is available.

Designed primarily for lighting outdoor areas, these cut-off fittings are hot galvanised sheet steel spinning, stove-enamelled grey outside and white inside. They have very heavy-gauge steel canopies tapped ¾ in. B.S.P. with a set screw for locking. Two adjustable and removable anodised aluminium reflectors are fitted to throw narrow controlled beams of light either side of the fitting. This feature makes the fittings eminently suitable for service station entrance lighting and other areas where controlled, glare-free lighting is required.

Prices are as follow:

R.8200, for 80/125W., MBF/N—£9 7s. 9d. each list.

R.8210, for 250W., MBF/U—£14 0s. 0d. each list.

Further details can be obtained from the manufacturer, Philips Electrical Limited, Century House, Shaftesbury Avenue, London, W.C.2.

Expansion Joint Sealant

SECOFLEX is a permanently plastic, waterproof, and non-toxic bituminous sealant for wide joints, cracks, and cavities in concrete, brickwork, asphalt and metal structures.

It is sold in half-gall. and one-gall. tins through builders' merchants.

Further information can be obtained from the manufacturer, Secomastic Limited, Western Road, Bracknell, Berks.

Fares Inquiry to be Resumed

The Transport Tibunal recently announced that it had decided to resume the inquiry into the application of the British Transport Commission over fares. The inquiry will resume on June 23 in London.

The announcement states: "We have, since our interim decision of May 8 was circulated, received a number of representations in writing. They include one from the Transport Commission. It contains suggestions as to the manner in which the original draft scheme might be altered so as to bring it into conformity with the conclusions stated in the interim decision. In our view these suggestions should be examined in public.

"We have, therefore, decided to resume the inquiry and directed the Commission to circulate copies of its representations among all those bodies who lodged objections and have a *locus standi*."

Three county councils and three borough councils are among objectors to the latest B.T.C. plans for fares increases.

New Proposals by B.T.C.

New proposals for early morning fares and season tickets have been put forward by the Commission in its latest submissions to the Transport Tribunal. The Commission wishes early morning fares in the London area to be abolished by the end of 1960 and before then on the rest of the railways. At the same time it is asking for power to raise these charges to bring them nearer to standard fares.

It seeks increases ranging from 4d. for six miles to 1s. 8d. for 60 miles. A further proposal is to retain the maximum of 4d. for 1½ miles until the end of 1961.

For season tickets, the Tribunal had asked for a new schedule with increases only half of those originally proposed by the Commission. Now, the B.T.C. has asked that this new scale shall apply only in the London area and then only until the end of 1960. Outside London the Commission seeks power to apply its original proposals for season tickets.

Under the original scheme the net annual increase to London Transport Executive would have been £5.8 million in 1960 and 1961. Under the revised scheme the increase would be £4.1 million in 1960 and £4.7 million in 1961.

The late Sir Archibald Boyd

A memorial service to the late Sir Archibald John Boyd, Chairman of the Metropolitan-Cammell Carriage & Wagon Co. Ltd., 1956-59, was held at St. Margaret's, Westminster, on June 10. Canon Michael Stancliffe officiated and the lesson was read by Mr. H. S. A. Altham. In addition to family mourners and representatives of Works Managers, Foremen and other members of the company's staff the following were among those present:—

Messrs. L. B. Alexander, E. Allsop, the Hon. Rupert Anson, Messrs. H. F. Asbridge, T. H. Baker, J. E. Beckett, R. A. Beckett, Sir George Binney, Messrs. A. C. Brougham, W. F. J. Bowring, D. C. Brown, P. D. Brunton, S. A. Bustard.

Lt.-Colonel G. H. M. Cartwright, Viscount Chandos, Messrs. A. H. Chilton, D. Cockburn, H. A. Cook, B.W.C. Cooke, S. D. Cooper, Brigadier W. H. Crosland, Mr. G. R. Curry, Sir Gervais Tennyson D'Eyncourt, Major C. Dennis, Major-General Sir Charles Dunphie, Mr. C. H. Dunt.

Mr. H. N. Edwards, Sir John Elliot, Colonel Sir Ralf Emerson, Commander L. G. H. Farmer, Messrs. E. O. Faulkner, L. F. Findlay, Dr. H. Gardiner-Hill, Messrs. M. A. Gardiner-Hill, K. W. C. Grand, E. W. Greaves, Colonel H. Gresham, Messrs. R. Gresley, J. R. Grimsdell, H. Grindley.

Lord Hacking, Mr. T. Halliday, Sir Kenneth Hague, Messrs. E. W. Hanslip, F. D. M. Harding, L. C. Hawkins, N. B. Henderson, W. W. Hicks Beach, A. H. Hird, C. P. Hopkins, N. G. Hunter, Lord Hurcomb, Sir Alexander Ingleby-Mackenzie, Messrs. J. G. James, W. T. James.

Messrs. John Keswick, W. J. Keswick, Sir Arthur Kirby, Viscount Knollys, Sir Robert Knox, Viscount Lambert, Messrs. W. H. Maass, A. Macdonald, C. Marzetti, F. Mason, J. C. Mather, A. S. Matthews, Colonel A. T. Maxwell, Messrs. E. J. Morris, D. Muir.

Messrs. J. R. Naisby, O. S. Naylor, Ivan Parr, A. W. Peacock, J. Philipson, K. Preston, Basil Pritchard, Captain A. H. Read, Messrs. H. Read, D. Rissik, Sir Reginald Robins, Mr. Edmund de Rothschild, Lord Rootes, Sir Leslie Rowan, Messrs. W. J. Ruston, J. S. Schreiber, M. W. Shorter, C. Leslie Smith, R. T. Smith, Sir Eric Speed. Messrs. F. J. E. Tearle, J. S. Tritton, C. G. Wallis, G. E. Walker, Graeme Watts, Lt.-General Lord Weeks, Sir John Wrightson, Mr. R. P. H. Yapp, Sir James Reid Young.

Inauguration of Kent Coast Electrification

Completion of Phase 1 of the Southern Region Extension of Electrification Scheme

THE first electric passenger train to the Kent Coast was run by British Railways, Southern Region, to Ramsgate on June 9, to inaugurate the new Kent Coast electric services. The public service came into operation on June 15, running at hourly intervals each way between London and the Thanet towns.

Some 200 guests travelled on the inaugural train as far as Margate where they attended a commemorative luncheon at the Winter Gardens. They included Mr. G. R. H. Nugent, Joint Parliamentary Secretary, Ministry of Transport & Civil Aviation; Sir Brian Robertson, Chairman of the British Transport Commission; Sir Philip Warter, Chairman of the Southern Area Board; Mr. C. P. Hopkins, General Manager of the Southern Region; and Mayors and other civic leaders from all parts of Kent.

An eight-car train, consisting of two four-car units brought the main party from London. At Faversham, another four-car unit with guests from Dover joined the London train so that the 12 cars could carry on to Margate as one train.

At Margate Station, Sir Brian Robertson and Mr. Nugent were welcomed officially by the Mayor of Margate and the Town Clerk.

Justification for Expenditure

Mr. Nugent, speaking at the luncheon, referred to the difficult task of electrifying the Kent Coast lines and congratulated Sir Brian Robertson, Sir Philip Warter, Mr. Hopkins, and all the Southern Region engineers for the task being "bang on time." Passenger traffic, he said, was rising slightly but freight revenues were dropping. The trend justified the spending of large sums on modernisation of the passenger side, but this could no longer be run at a loss on the basis of a subsidy from other railway revenues. The Commission's fares review should be regarded in this light. Staggering of peak-hour travel would increase passenger comfort and reduce uneconomic operation. He hoped that if fare increases were needed the Commission would find some means of giving an inducement in this direction.

Transfer to Phase 2

In his reply, Sir Brian Robertson thanked Mr. Nugent for his kind remarks which were most encouraging to all those engaged on the task. It gave him great pleasure, he said, to be able to offer a genuine piece of progress instead of speaking about things to come. Now that phase 1 was completed the Southern Region would immediately transfer its resources to the next stage of the Kent electrification.

He referred also to the other schemes now in hand on other Regions of British Railways and stated that the British Transport Commission had benefited greatly in a.c. electrification from its colleagues on the Continent, particularly those in France and Belgium. He was very pleased that Monsieur P. Dargeou, Director General, French National Railways; and Monsieur de Vos, Director General, Belgian National Railways, could be present at the luncheon.

Sir Philip Warter proposed the toast to the Kent Coast Resorts, and the reply was made by Alderman G. A. Kirby, the Mayor of Margate.

P.W.I. annual Summer Dinner

Sir Brian Robertson, Chairman of the British Transport Commission, was the principal guest at the Permanent Way Institution Annual Summer Dinner at the Connaught Rooms, W.C.2, on June 9. Mr. C. E. Dunton, Chief Civil Engineer, London Transport Executive, was in the chair. The dinner took place during the 1959 Summer Convention of the Institution, held this year in London to mark the 75th Anniversary of the P.W.I. Those present included Mr. John Ratter, Member of the B.T.C. and Immediate Past-President of the Institution; Mr. K. W. C. Grand, Member of the B.T.C.; Mr. J. Lohmann, General Manager of the Netherlands Railway; Messrs. C. P. Hopkins and J. R. Hammond, General Managers, respectively, of the Southern and Western Regions of British Railways; Brigadier C. A. Langley, Chief Inspecting Officer of Railways, Ministry of Transport & Civil Aviation; and permanent way engineers from the Netherlands and French National Railways.

Sir Brian Robertson proposed the toast of the Institution. He expressed his admiration for its aims and ideals and the way in which they were being achieved. He also praised the high standard of British Railways permanent way.

Mr. John Ratter proposed the health of the guests. Brigadier C. A. Langley in his reply emphasised the importance of Royal Engineers Railway Transportation units. He had, he added, a high opinion of British railwaymen.

Mr. L. T. C. Rolt proposed the toast of "absent friends."

Turner & Newall Limited Interim Dividend.—Turner & Newall Limited has declared an interim dividend of 5 per cent, less income tax, for the year ending September 30, 1959, on the ordinary stock. Group profits have been somewhat reduced compared with 1958.

Contracts and Tenders

Bogie low-sided wagons for Pakistan

British Railways, London Midland Region, has placed the following contracts :

W. H. Heywood & Co. Ltd.: renewal of roof coverings at Hellifield Passenger Station

The Demolition & Construction Co. Ltd.; retaining walls at Bletchley Flyover

J. B. Corrie (Flextella) Limited: 1959 fencing programme in the London District

Mellowes & Co. Ltd.: patent Glazing in new main repair shed and workshop at Crewe District Electric Depot

William Tomkinson & Sons Ltd.: new offices and amenities buildings at Huskisson Goods Depot, Liverpool

E. B. Jones & Rawlinson Limited: improved stores and staff accommodation at Ardwick Cleaning Depot, Manchester

Eagre Construction Co. Ltd.: concrete duct water mains (multiple unit only) for carriage washing facilities at Cricklewood.

The Special Register Information Service, Export Services Branch, Board of Trade, has received calls for tenders as follow:—

From Pakistan :

52 broad-gauge (5 ft. 6 in.) bogie low-sided wagons, "BO" type, complete with body of welded construction and underframe of riveted construction, bogies, wheels and axles, vacuum brake fittings, draw and buffing gear, painted, crated, and packed

Alternatively

52 broad-gauge (5 ft. 6 in.) bogie low-sided wagons, "BO" type, complete with body and underframe of all-welded lightweight construction, bogies, wheels and axles, vacuum brake fittings, draw and buffing gear, painted, crated, and packed.

The issuing authority is the Director General (Railways), Railway Division, Ministry of Railways & Communications, Government of Pakistan, Karachi. The tender No. is PRS-59/WHG/2/TDR. Bids should be addressed to the Joint Director (Procurement & Development), Railway Division, Ministry of Railways & Communications, Room No. 302, 2nd Floor, Tughlaq House, Shahrah Kamal Ataturk, Karachi. The closing date is July 2, 1959. Local representation is essential. The Board of Trade reference is ESB/13473/59.

From Portuguese East Africa:

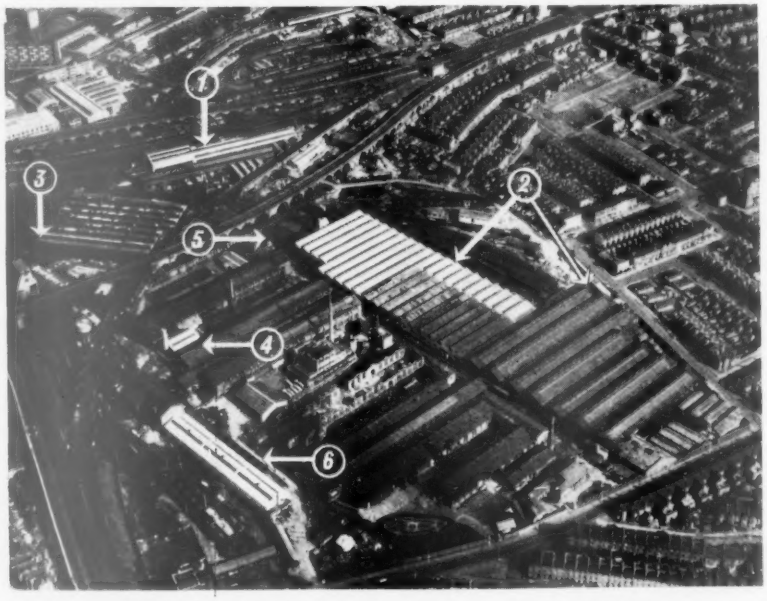
48 items of spares for locomotives including shock absorbers, wheel and axle assemblies, journal boxes, couplings, coupling mirrors, knuckles, springs, pivot plates and fittings, elastic guides for journal boxes, vacuum cylinders, rubber pistons and bellows and traction gear.

The issuing authority is the Posts, Railways & Transport Department, Lourenço Marques The tender No. is 131/59. The closing date is July 13, 1959. A deposit of Esc. 80,000 is required. Local representation is essential. The Board of Trade reference is ESB/13472/59.

Further details regarding the above tenders, together with photo-copies of tender documents, can be obtained from the Branch (Lacon House, Theobalds Road, W.C.1).

Notes and News

New Works at Stewarts Lane, Southern Region.—The accompanying illustration shows the works completed or still being carried out at Stewarts Lane, Battersea, British Railways, Southern Region. The total cost is roughly £1¼ million. The numbers refer to: (1) new electric locomotive running shed; (2) extension and conversion of existing steam carriage shed for servicing and inspection of multiple-unit electric stock; (3) conversion of part of steam locomotive shed to diesel-electric locomotive maintenance depot with external oil fuelling installation and other special equipment; (4) new boiler house for central heating installation for new and existing buildings; (5) school for training drivers in new forms of motive power; and (6) rehabilitation of Longhedge Stores Depot. The civil engineering contractors for the first five items are Holloway Bros. (London) Limited. The contractor for item (6) was the London Ferro-Concrete Co. Ltd.



Aerial view of new works at Stewarts Lane, Southern Region

Wallingford Branch Passenger Service Withdrawn.—The passenger train service between Cholsey & Moulsford (Berks) and Wallingford, in the Western Region of British Railways, was withdrawn on June 15. Wallingford Station was closed for passengers. The line, opened in 1866, is 2¾ miles long. There are bus services in the area.

Re-appraisal of Railway Modernisation Plan.—Sir Brian Robertson, Chairman of the British Transport Commission, addressing the Manchester Luncheon Club, stated recently that the re-appraisal of the financial position of the Commission and of the modernisation plan was nearly complete and soon would be in the hands of the Minister of Transport & Civil Aviation, Mr. Harold Watkinson. It would show that the railways could in due course attract sufficient revenues to cover their costs, given freedom to do so. The railways had received help from the Government and they might need more help. "The re-appraisal," he added, "will give our views both as to the future role of the railways and as to shape of the system needed to carry out this role."

New Electric Stock for Manchester-Bury Line.—Two-car electric trains, to replace the present vehicles on the Manchester-Bury line, London Midland Region, are now being delivered. Built at the Wolverton Works of British Railways they have an entirely new profile at the driving cab ends, and bodies of welded steel insulated against sound and changes in external temperature. Interior finish is a blend of timber and plastic-faced wall panelling with light-alloy luggage racks. Double spring type seating is provided upholstered in moquette. The under-seat heaters are thermostatically controlled. Each two car set will carry 16 first and 162 second class passengers and the accommodation varies from compartment to open (saloon) type seating with provision for non-smokers. There is a 'ladies only' compartment and a guard's brake compartment on each set. The two cars have 34 opening doors between them to facilitate speedy movement of passengers

OFFICIAL NOTICES

CRAVENS, LTD., Sheffield, urgently require Draughtsmen with experience in general engineering, rolling stock or machine tool design, age 25-30. Minimum qualification O.N.C. Pension scheme, etc. Apply Personnel Manager.

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Applicants must have trained in Railway Draughtsmanship, be able to survey existing trackwork, plot same to working scale and be fully conversant with theodolite and level practice.

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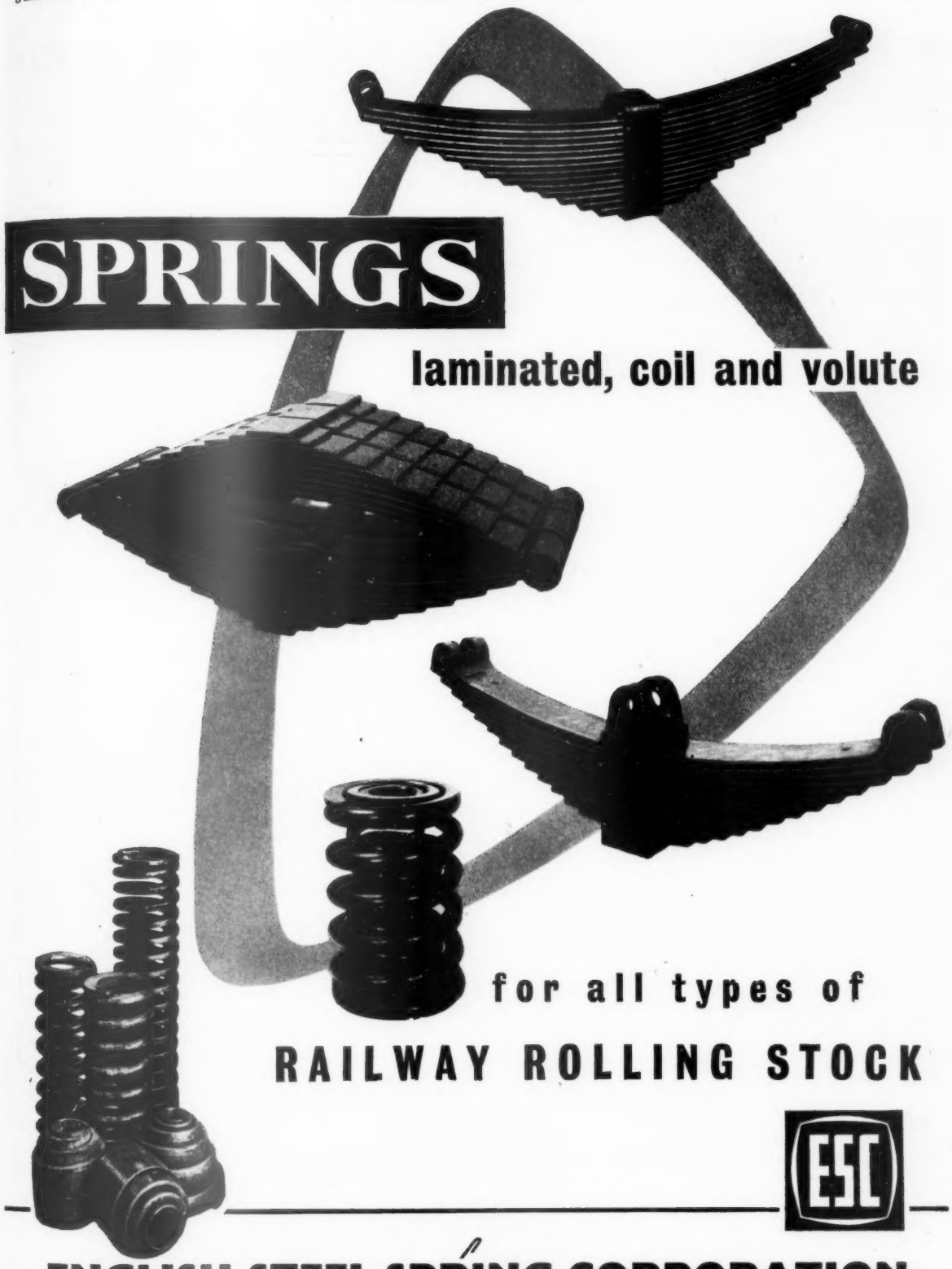
Write in first instance, stating age, experience and salary required to: Sidings Construction Department Manager, Thos. W. Ward Ltd., Albion Works, Sheffield 4.



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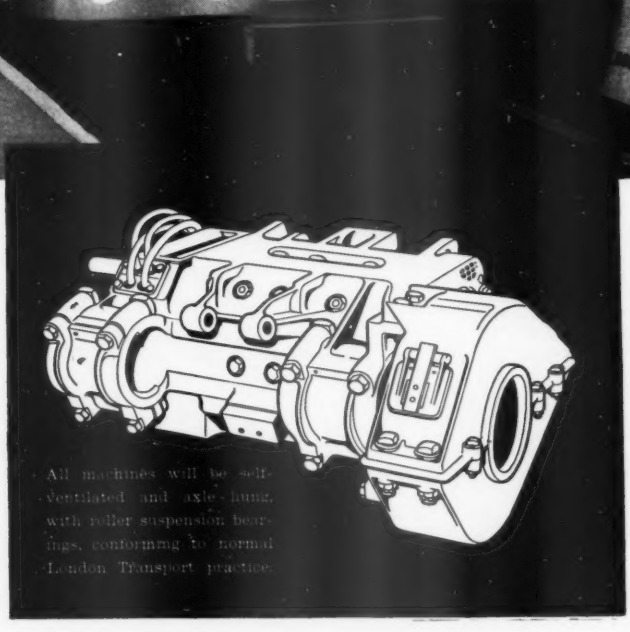
1,200 G.E.C. traction motors ordered by London Transport

The motors are for tube and surface rolling stock to implement London Transport's replacement programme announced last year. All these machines will be built at the new traction motor works of the G.E.C. at Dudley Port, Staffs.

The Piccadilly Line will have 760 G.E.C. traction motors with a continuous rating of 80.5 h.p. at 66% field. They will be generally similar to the 32 machines already supplied by G.E.C. for the three prototype tube trains now running on the Piccadilly Line.

The Metropolitan Line of London Transport will have at least 446 G.E.C. traction motors with a continuous rating of 69.5 h.p. at full field. With the completion of these orders G.E.C. will have supplied over 4,500 railway traction motors to London Transport since 1925.



All machines will be self-ventilated and axle-hung, with roller suspension bearings, conforming to normal London Transport practice.

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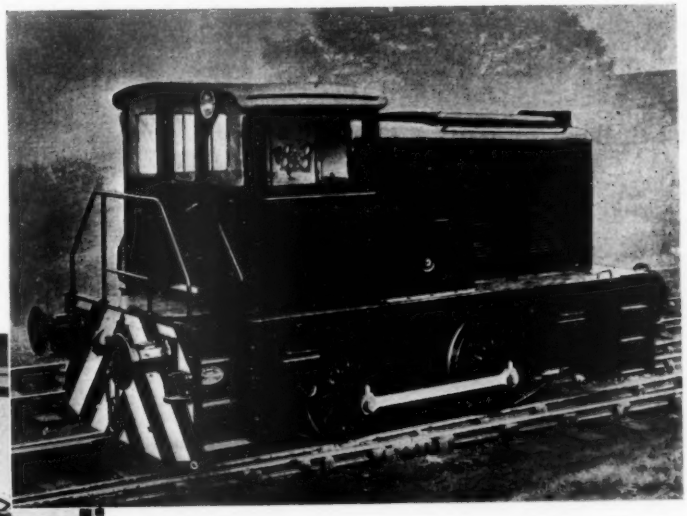
Some new diesels

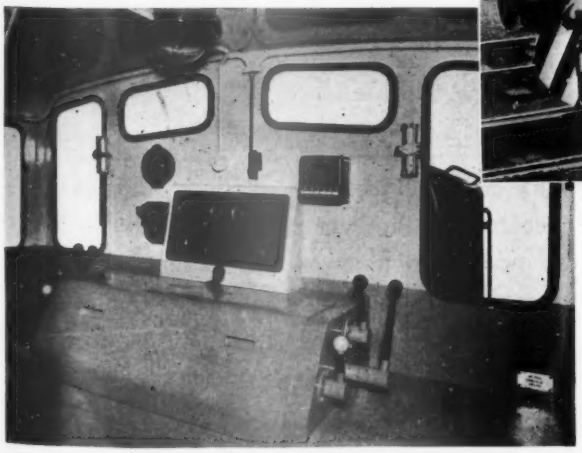
fitted with WESTINGHOUSE

BRAKE EQUIPMENT

One of 15 for service on the Scottish Region, British Railways. 204 b.h.p. diesel mechanical locomotives built by Andrew Barclay Sons & Co. Ltd., Kilmarnock, fitted with Westinghouse vacuum controlled straight air brake.

Two types of Yorkshire Engine Co.'s diesel-hydraulic shunters, powered by Rolls Royce engines, recently introduced, are fitted with Westinghouse Pneumatic Control Equipment to provide very rapid reversing with the minimum of effort on the part of the driver, with complete protection for the reverse gearbox by means of the Westinghouse Standstill Detector. The equipment consists of throttle and dynamic brake control, forward/reverse selection, neutral/drive selection and automatic change-over mechanism for direct drive from convertor drive.





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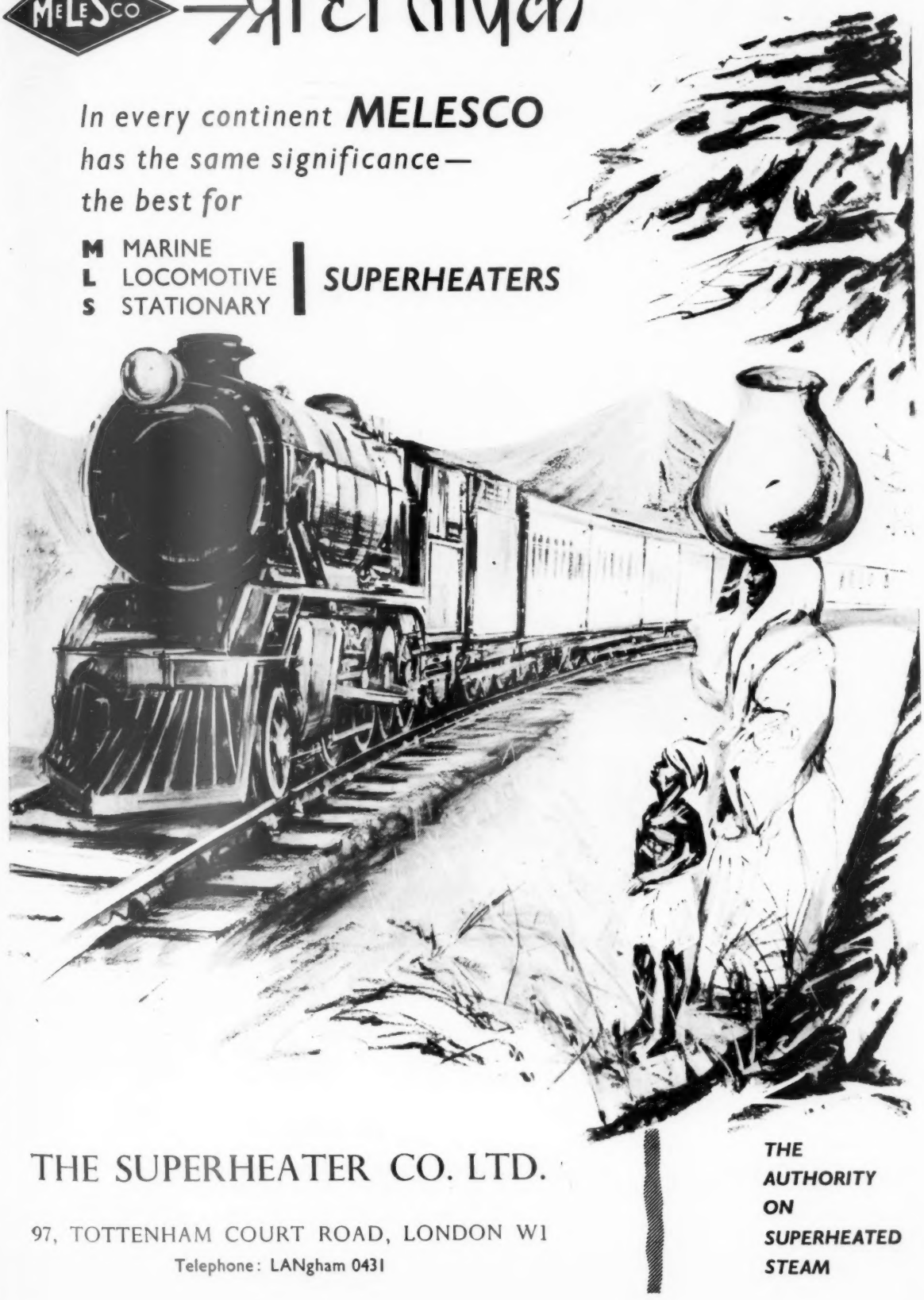

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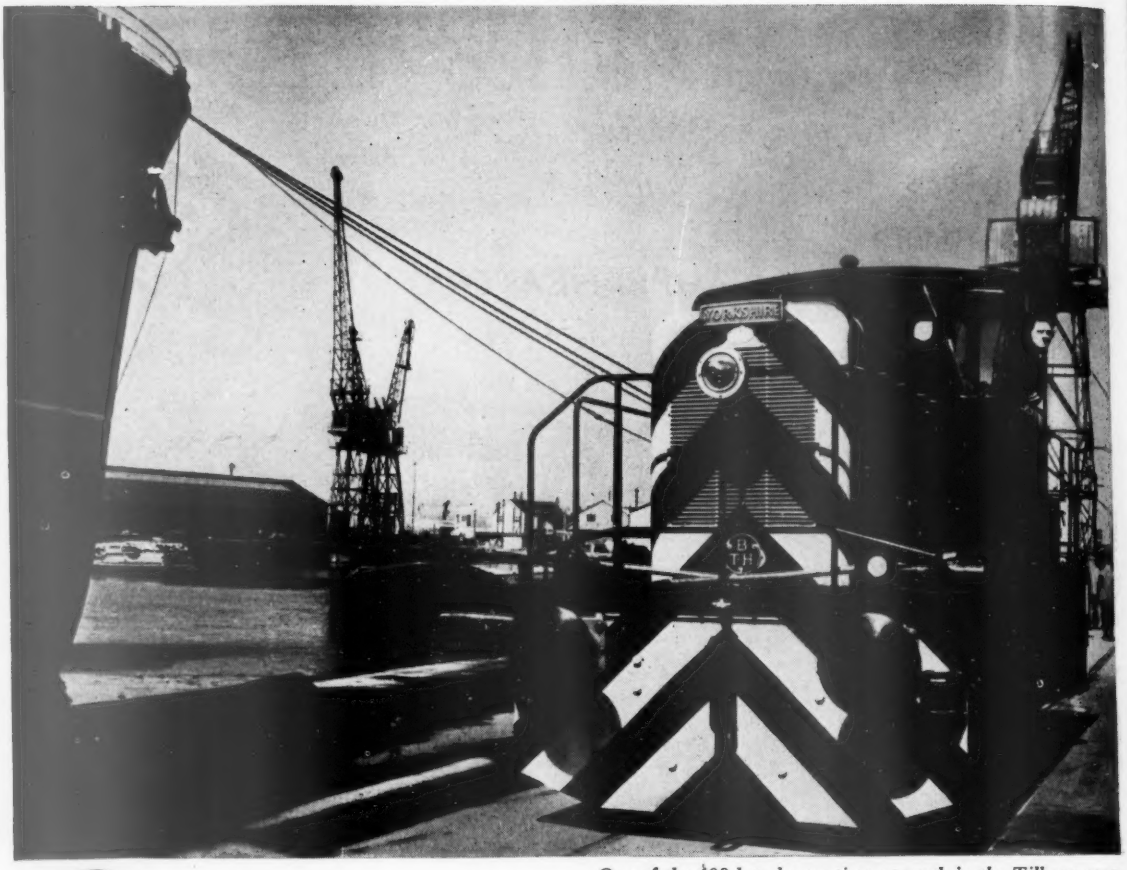

One of the 400 h.p. locomotives at work in the Tilbury area.

B T-H **Electric Traction Equipment**

As part of their programme of steam-locomotive replacement, the Port of London Authority has ordered from the Yorkshire Engine Company sixteen diesel-electric shunting locomotives (twelve of 300 h.p. and four of 400 h.p.). BTH are responsible for the electric traction equipment including the diesel-generating sets powered by Rolls-Royce engines.

Six 400 h.p. locomotives of the same type have already proved themselves in service with the P.L.A. for over a year.

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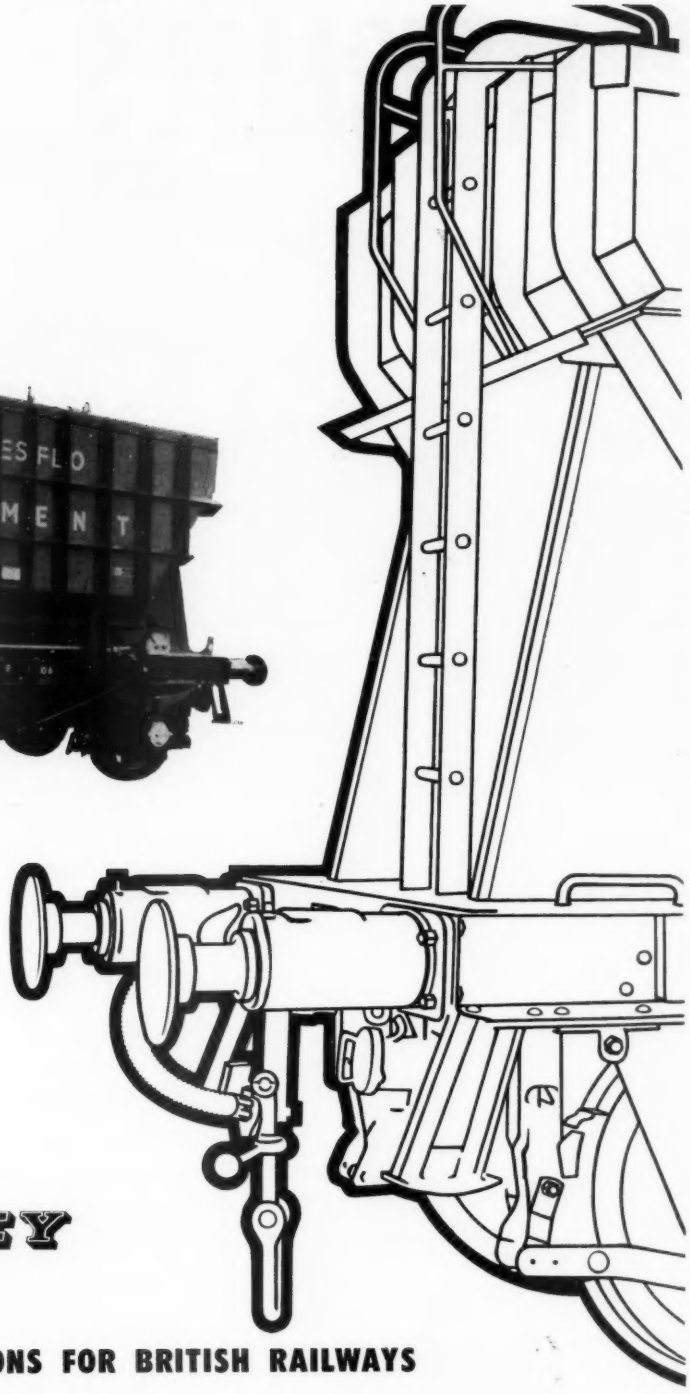

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BULK CEMENT WAGONS FOR BRITISH RAILWAYS

Butterley have recently completed an interesting contract from British Railways for a quantity of bulk cement wagons. Each was designed to carry a load of 20 tons of cement and to be discharged by compressed air. To withstand the pressures and loads involved the wagon bodies are heavily ribbed—both frames and bodies are of all-welded construction.

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TYPE FV.3 An Automatic Driver's Air Brake Control Valve suitable for medium length goods and passenger trains or railcars, etc. This Valve is simple to operate and of light weight construction. It enables the full benefit to be obtained from modern step-by-step application and release of air brakes. Leaflet A.1.

TYPE FV.4 A standard Driver's Automatic Air Brake Control Valve with automatically controlled high pressure brake releasing impulse. This Valve enables the maximum speed of brake release to be obtained, and in addition enables the full utilisation of all the advantages associated with modern air brakes. The Valve is reliable in service and simple to operate and maintain and is especially suitable for long express passenger and goods trains. Leaflet A.4.

TYPE FD.1 This is a simple Brake Control Valve suitable for direct braking or shunting brake requirements. It is very simple to use and accurate in operation. The type FD.1 Valve can also be adapted for the control of the Diesel engines and can also be made suitable for cam operation. Leaflet A.13.

TYPE LST.1 A locomotive Triple Valve of modern and simple design. The LST.1 Operating Valve embodies a control for freight or passenger train operation, together with a high efficiency Brake relay, also an Anti-skid Brake device may be provided when required. This Valve is capable of controlling the air supply to several Brake Cylinders when required. Leaflet A.2.

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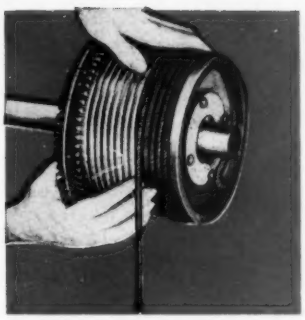
A positive air brake which releases when the throttle opens is automatically applied as the throttle closes. The load cannot fall if the air line breaks or the compressor shuts down while the hoist is in operation.

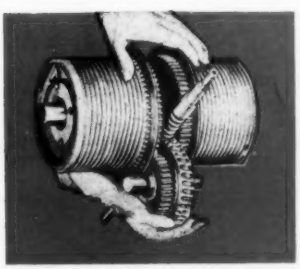
EQUIPPED WITH WORM GEAR DRIVE

The positive worm, driving in both directions, in addition to the shifting eccentric used in the motor, permits the location of the load in any exact position. This ability to locate the load is absolutely necessary in handling foundry flasks, setting up automobile bodies in position on the assembly track, or setting up work for machine operations.

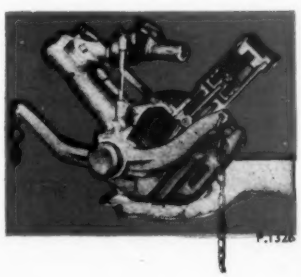
R57



The grooved drum assures no climbing. No slipping. No jerking. No frayed and dangerous cable. The cable ends are widely separated when the cable is down, thus preventing the load from twisting and winding up.



The motor: Famous Armstrong Whitworth Close-Quarter type Motor with non-leakable seat throttle. Double-acting pistons cushioned at both ends of stroke to further reduce vibration.



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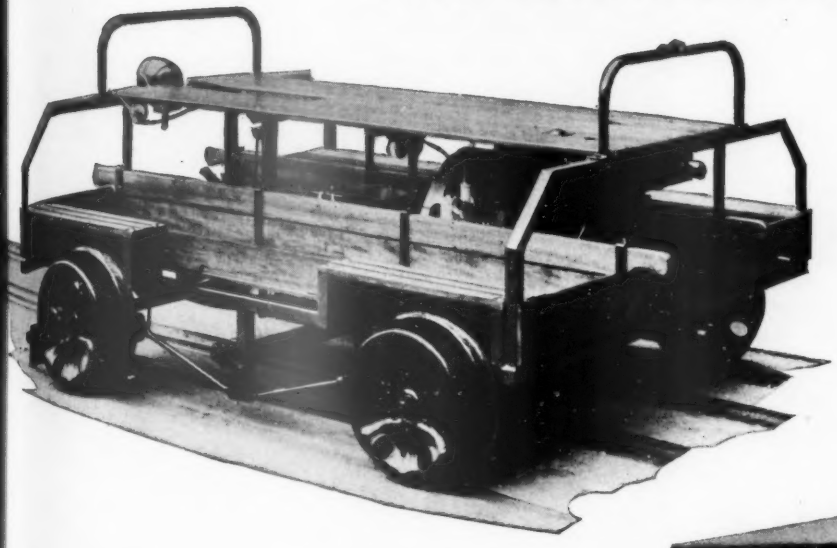

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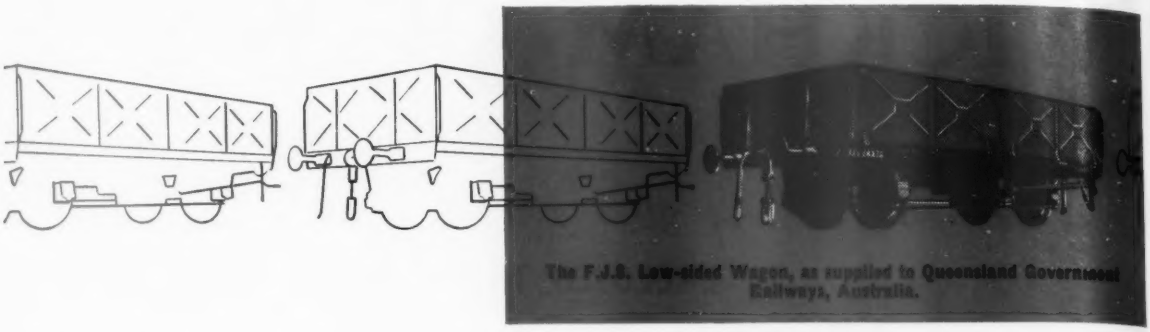

The F.J.S. Low-sided Wagon, as supplied to Queensland Government Railways, Australia.

The 20-ton Built Grain Van, used by British Railways.

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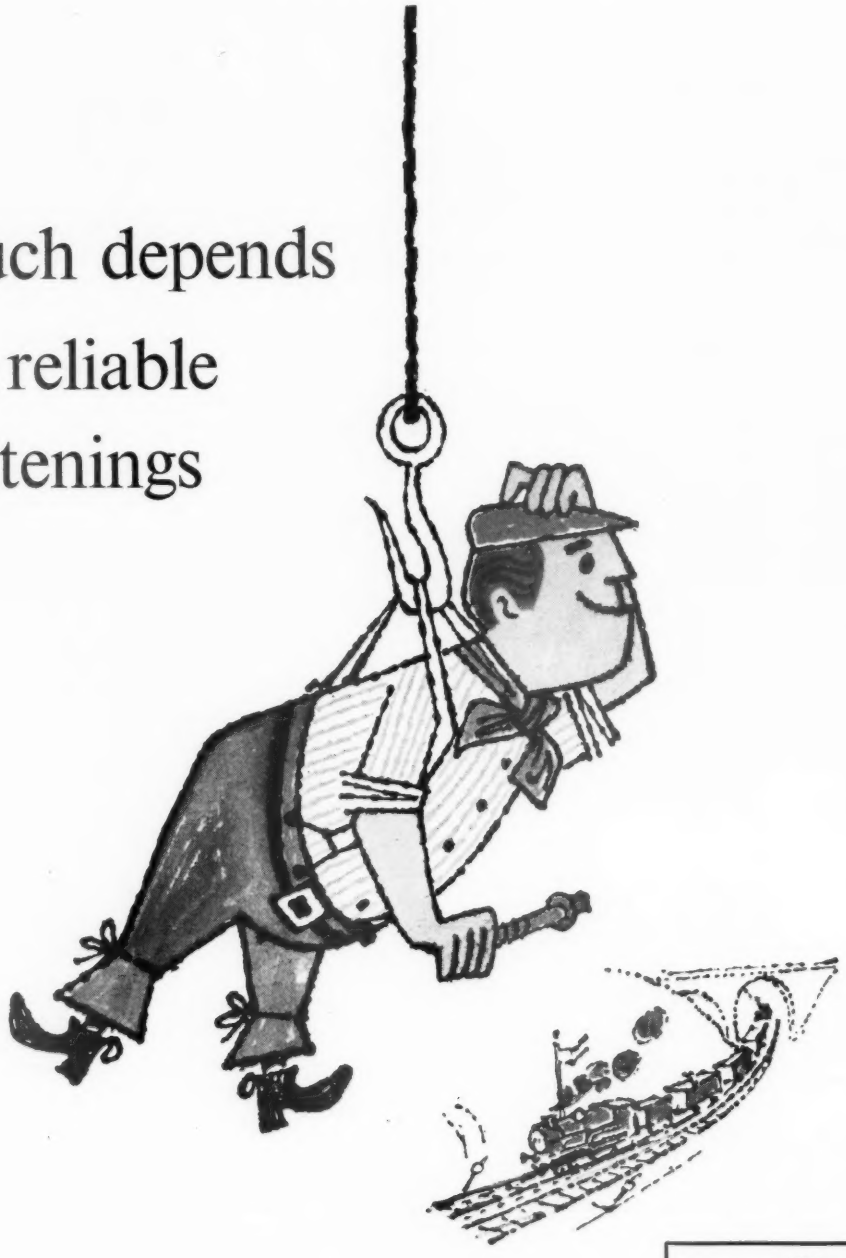

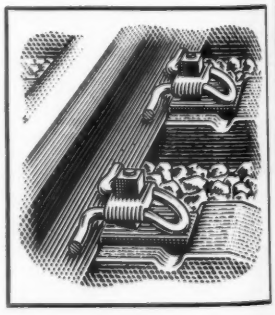

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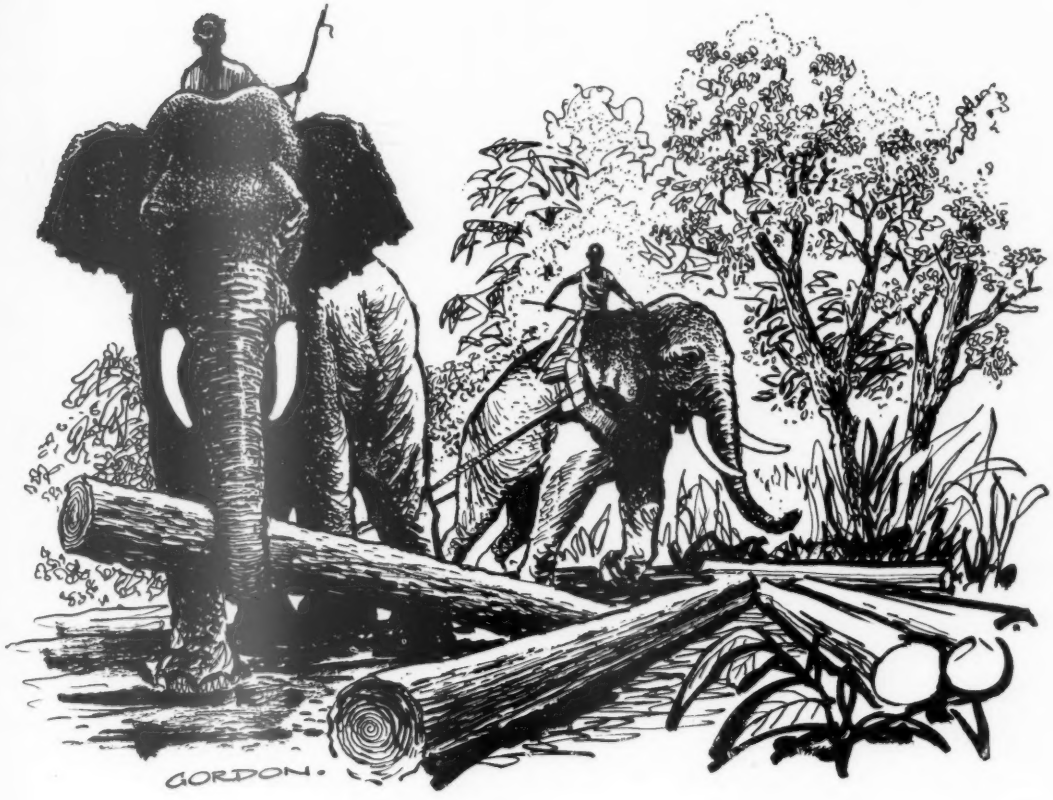

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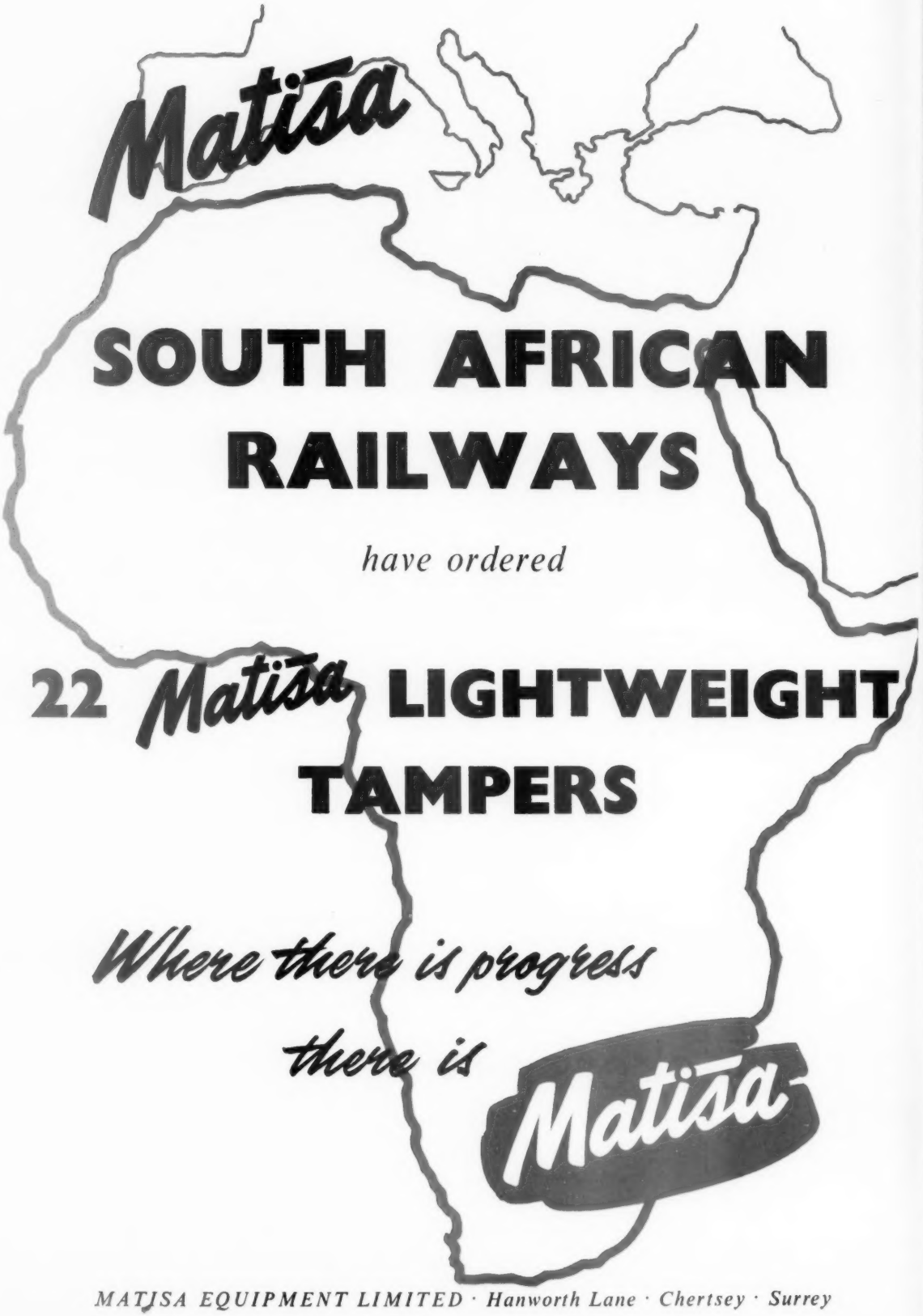

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portable welding equipment

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The welding generator, driven by a governed 25 h.p. air-cooled engine, provides 300A continuous, with a maximum of 400A. Engines can be supplied for running on petrol or propane gas. The auxiliary generator gives 27.3A at 110V d.c. for operating auxiliary equipment. The complete assembly is mounted in a wheeled tubular frame with all controls, the total weight being about 965 lb. A pair of tubular detachable handles is provided for manœuvring the unit on the site.

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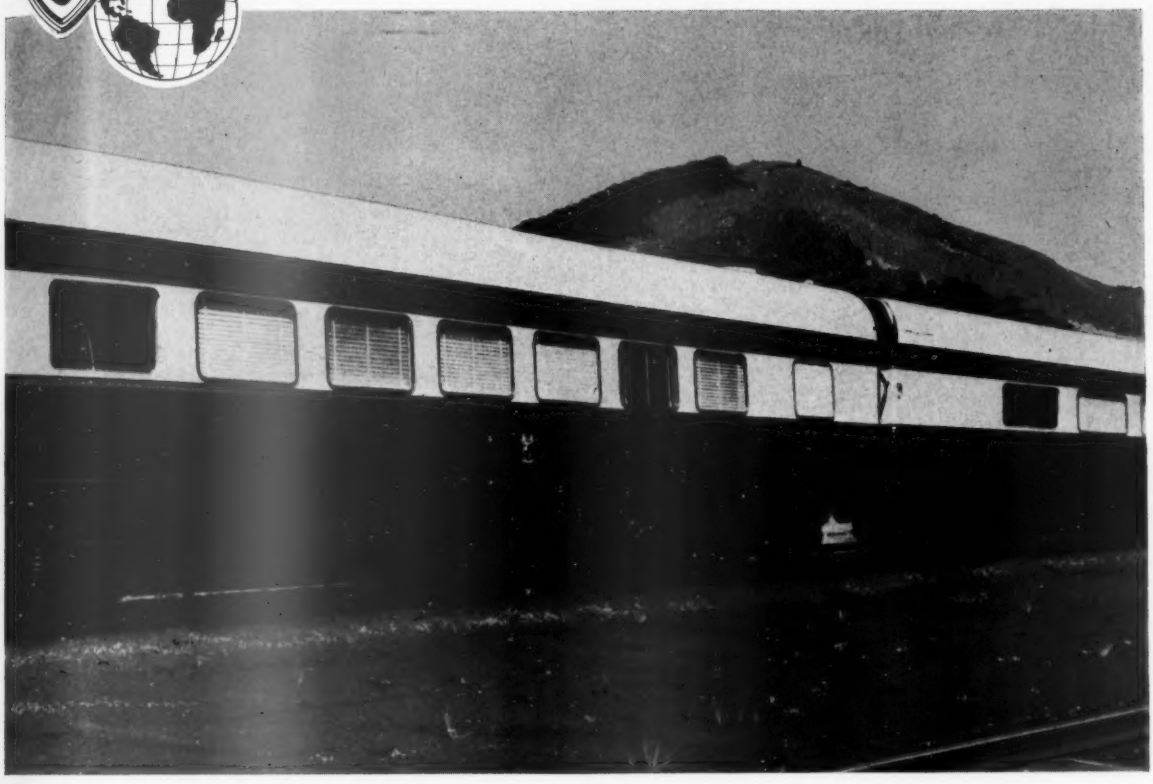

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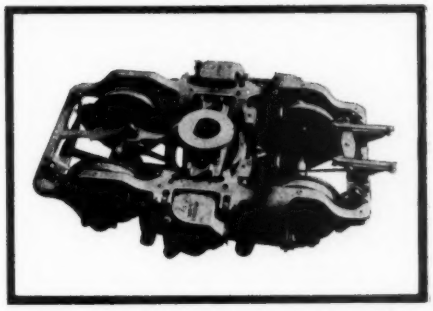
Where smooth riding and passenger comfort count the most, that's where you are sure to find Commonwealth designed products—like the bogies on the de luxe twin diners of South African Railways shown here. This application is a typical example of the way in which Commonwealth products are serving railroads throughout the world.

Specialized engineering combined with extensive manufacturing and servicing facilities make General Steel the world's outstanding supplier of one-piece cast steel devices for railroad equipment. These products are available through Commonwealth Sales Corporation and its licensees for use on railroads and in industry the world over.



Four-wheel bogie, equipped with outside swing hangers and central bearing — as furnished to Wegmann & Co., Germany, for use on twin diners for South African Railway.

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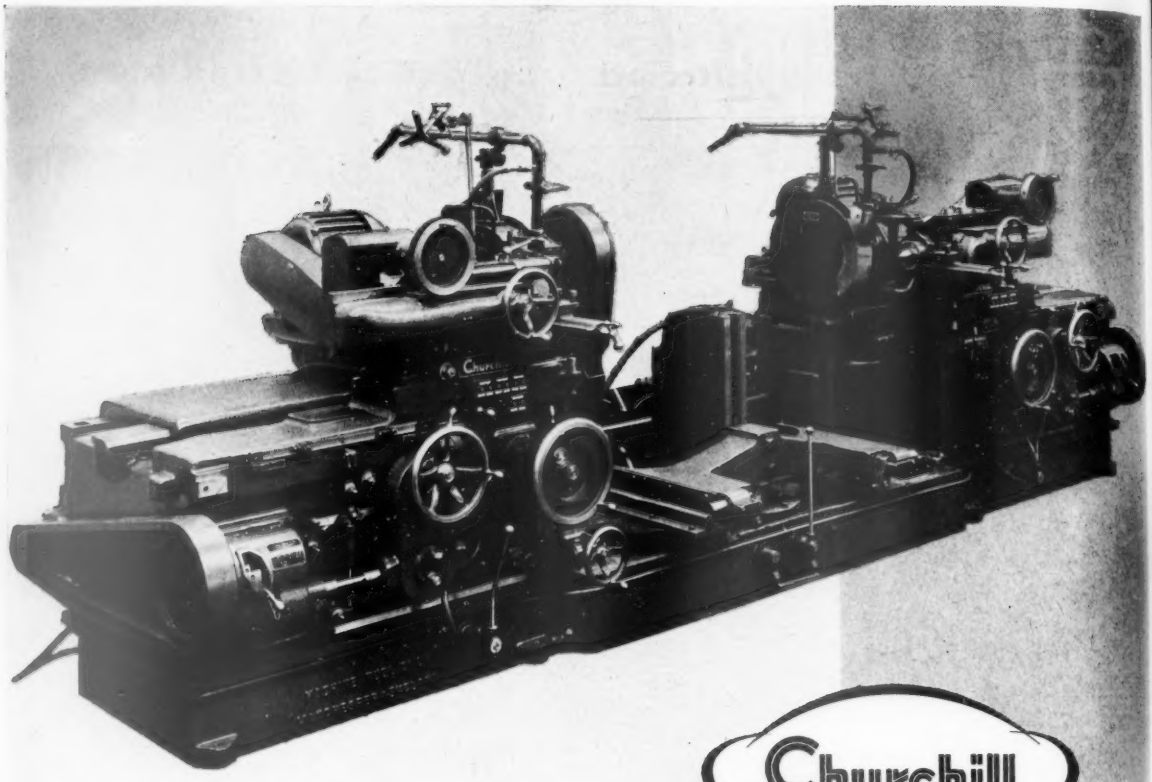

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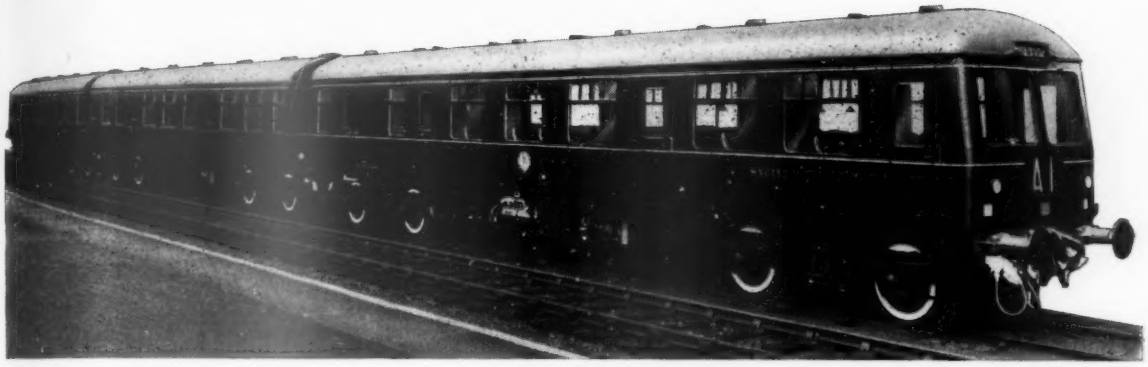

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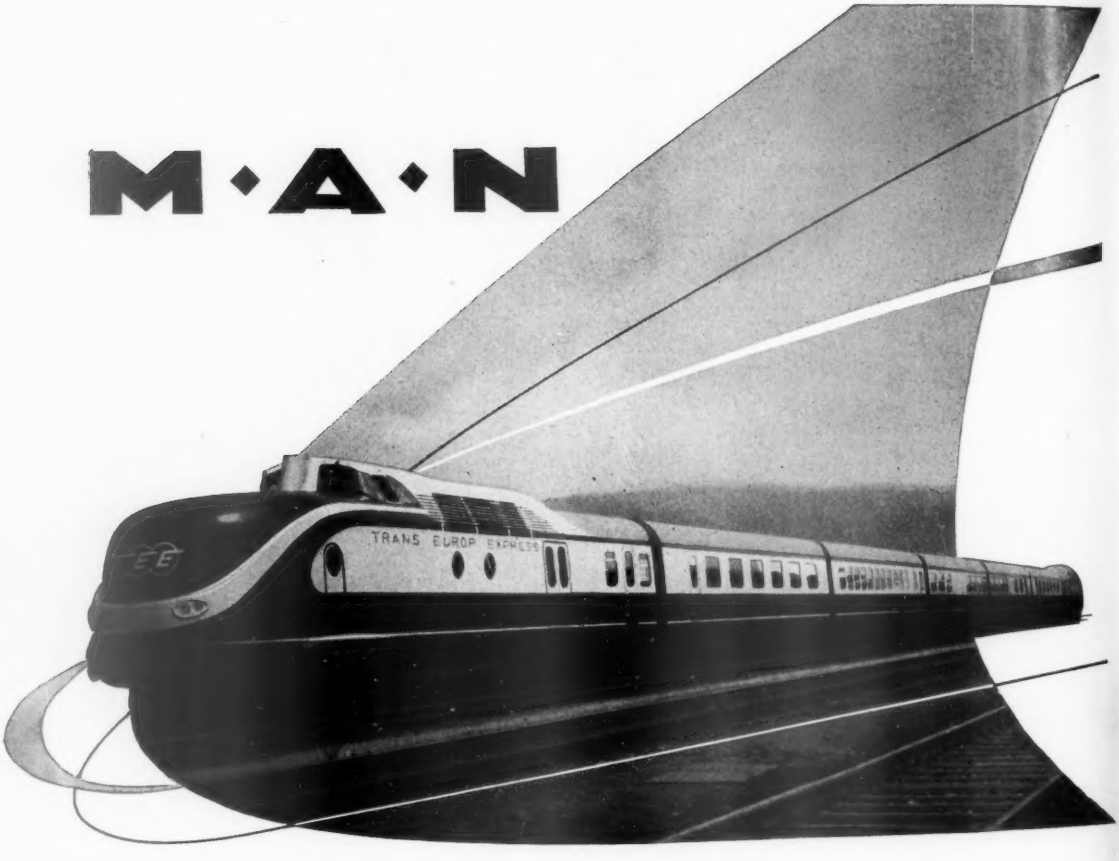

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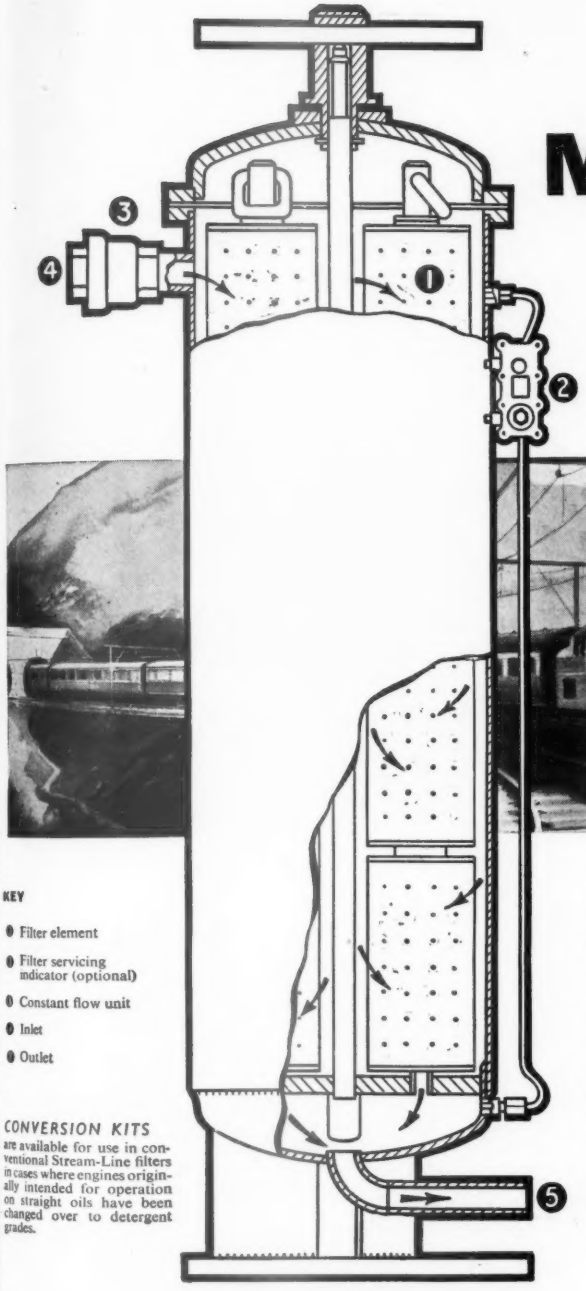
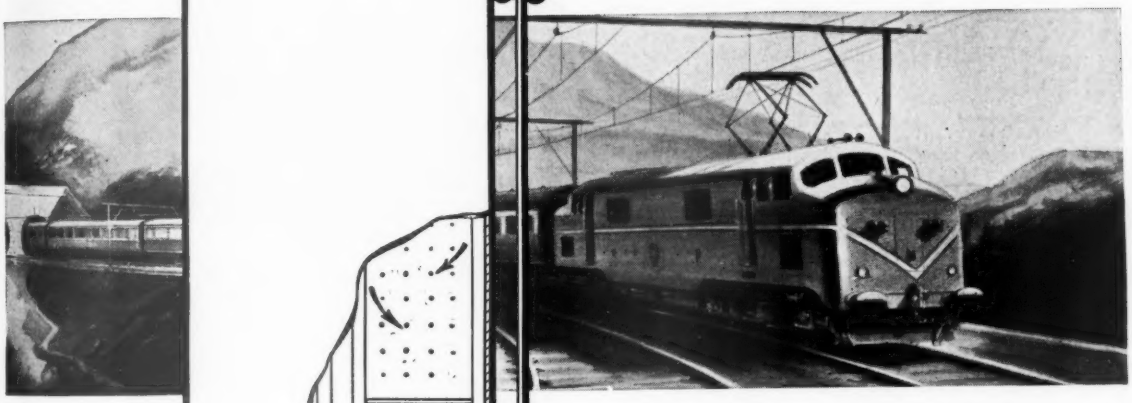
NOW! STREAM-LINE'S NEW MICRO-PAK

By-Pass Filter for Detergent Oils





KEY

1. Filter element
2. Filter servicing indicator (optional)
3. Constant flow unit
4. Inlet
5. Outlet

CONVERSION KITS are available for use in conventional Stream-Line filters in cases where engines originally intended for operation on straight oils have been changed over to detergent grades.

For many years engineers have accepted with enthusiasm the service given by the Stream-Line edge type filter for keeping *straight* mineral lubricating oils perfectly clean and thus ensuring the highest engine performance.

Now the same requirement can be met in the case of *detergent* oils by the new Stream-Line MICRO-PAK filter. Along with the maximum filtration efficiency practicable in these conditions the MICRO-PAK sustains an output far in excess of that of the conventional Stream-Line filter used for straight oils, and these characteristics combine to give a clean engine and long oil life.

This new Stream-Line model has elements which are moderately priced, have a long life and are easily renewable.

May we send you details?

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SF/43

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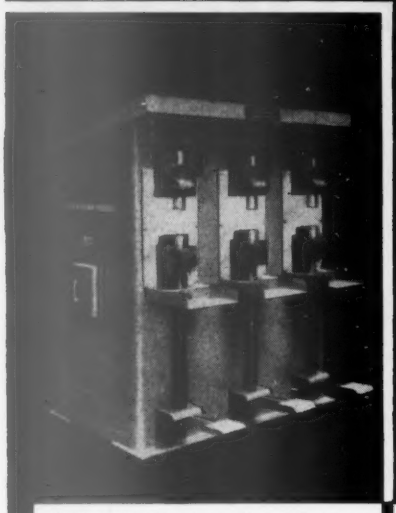
Hot rivets are always ready at a few seconds' notice with Metrovick resistance heating machines. The system is economical, too, since the use of current is confined to periods of actual heating.

Both single and multi-head types are simple to operate and require little maintenance apart from electrode dressing. The electrodes are quickly adjustable and, in multi-head types, separate transformers are used so that rivets of different sizes can be heated simultaneously.

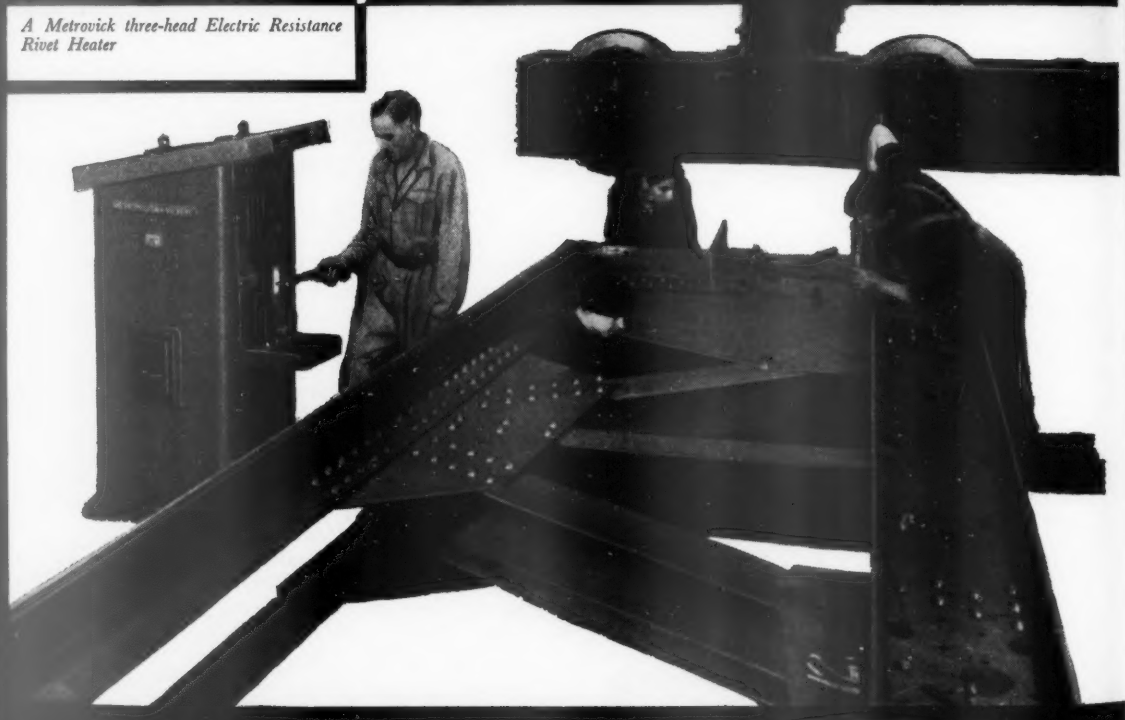
Heat is concentrated in the shanks whilst the heads of the rivets remain comparatively cool; full visibility during heating reduces the risk of burning. The machines are of strong, drip-proof construction enabling them to be used in semi-exposed positions.



A Metrovick three-head Electric Resistance Rivet Heater

CHARACTERISTIC DATA *(Applicable to each head)*

Equivalent continuous rating (kVA)	10	17	25
Maximum input in normal operation (kVA)	15	25	35
Normal heating range for M.S. rivets	$\frac{5}{16}$ in. x 1 in. to $\frac{7}{8}$ in. x 4 in.	$\frac{3}{8}$ in. x $1\frac{1}{4}$ in. to $1\frac{1}{8}$ in. x 4 in.	$\frac{3}{8}$ in. x $1\frac{1}{2}$ in. to $1\frac{1}{4}$ in. x 6 in.
Average output in lb. per hour	40	65	90



A Metrovick single-head electric rivet heater in use for heating rivets for a 160-ton crane at the Winsford, Cheshire, factory of Messrs. Henry Smith & Company Limited

METROPOLITAN-VICKERS
ELECTRICAL CO LTD TRAFFORD PARK · MANCHESTER, 17

An A.E.I. Company

This locomotive "Explorer" is fitted with a **LISTER BLACKSTONE** 1200 h.p. rail traction diesel engine type tested to B.S. 2953 at traction ratings of 1100 b.h.p., and equipped with BTH electric transmission.

Further details of performance and full technical data concerning this and other types of locomotives are available.

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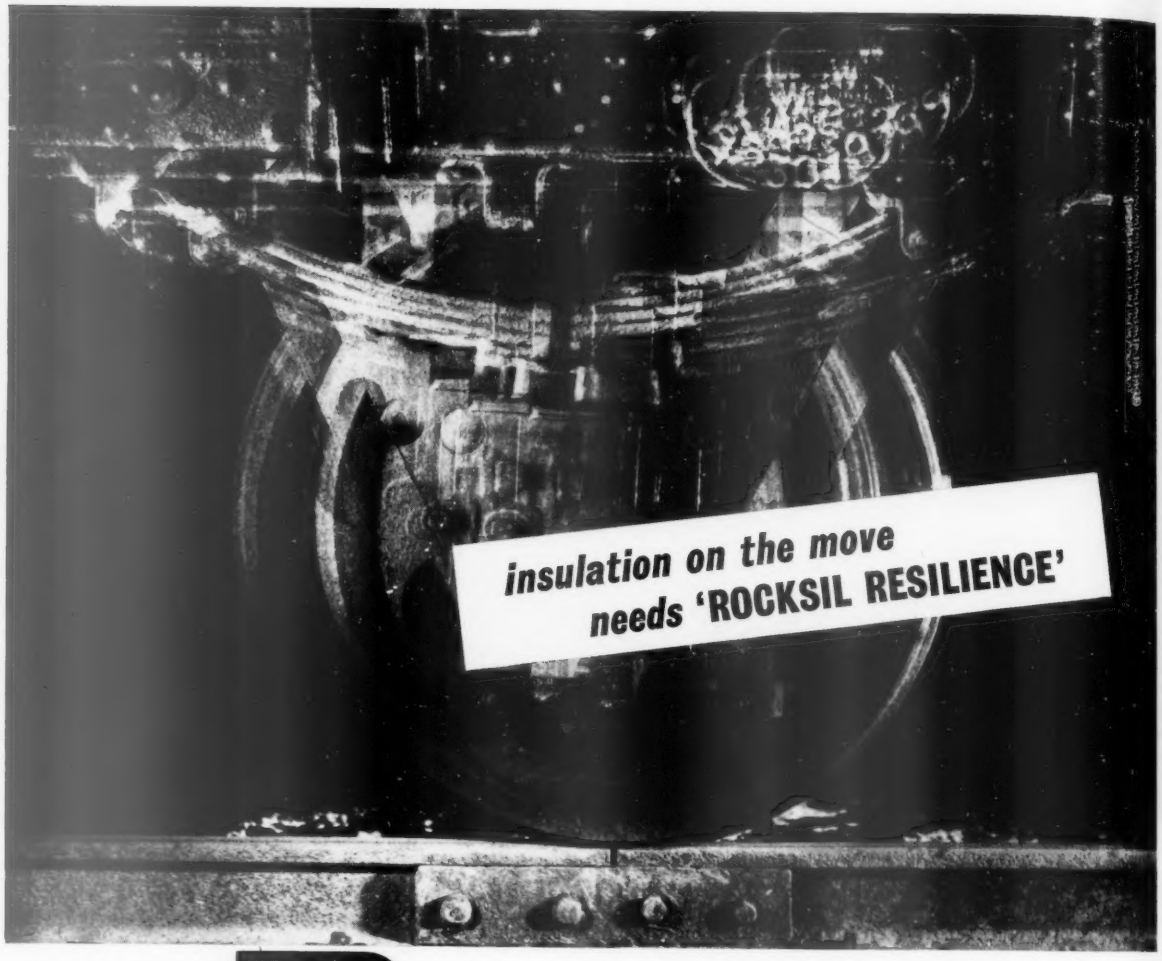

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The Station Master or Goods Agent will keep stock records and send advices to customers on your own notepaper. They will also be glad to supply any information about these services.

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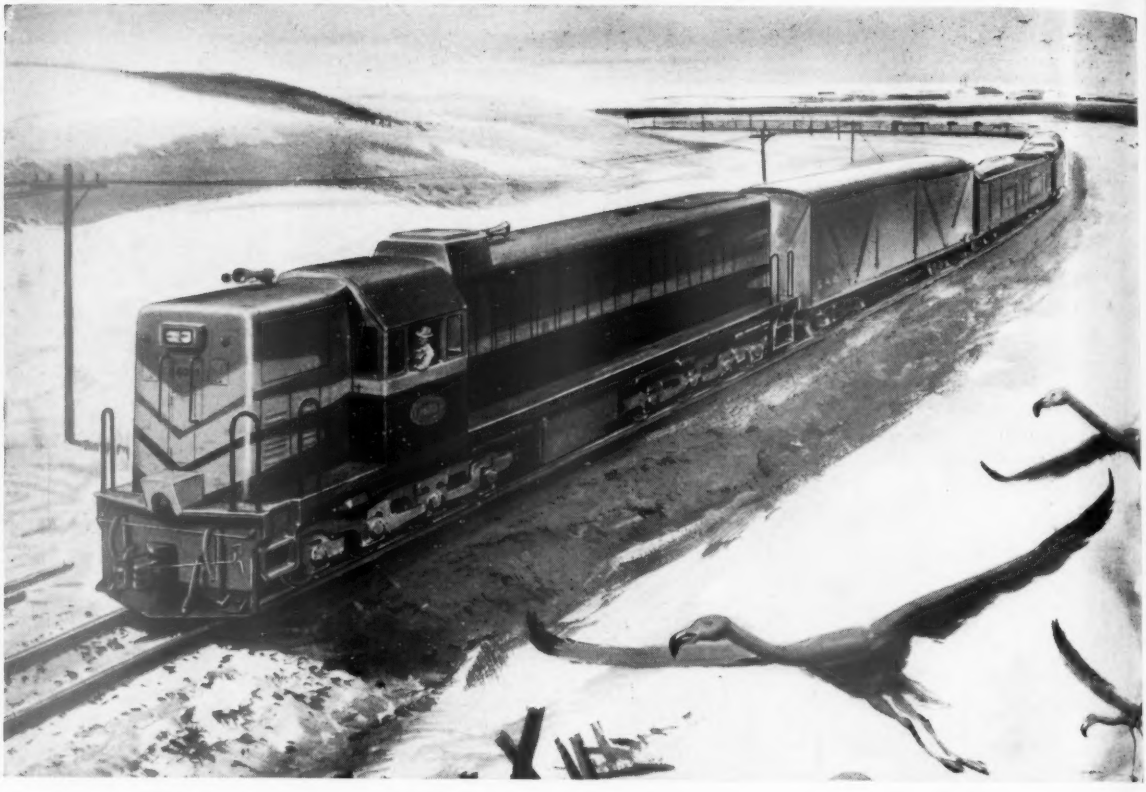

South Africa places repeat order for G-E universal diesel-electrics

115 locomotives (1980 hp) to dieselize South West Africa; First order of 45 units (1320 hp) now serving Transvaal

Selected for their ability to meet demanding operating requirements, 115 G-E Model U18C1 locomotives will soon be put into service in South West Africa. These 1980 hp locomotives will operate in freight, passenger, and switching service – replacing all steamers throughout the extensive S.W.A. system. Already the SAR has 45 Model U12B 1320 hp universal locomotives proving their dependability in freight service around Johannesburg.

The high horsepower of the U18C1 diesel-electrics, their ruggedness and low weight per axle have enabled the South African Railways to utilize a single locomotive for both main and branch line service. To ensure maximum reliability in desert operation a special air filtration and cab pressurization system is provided. Moreover, the scarcity of water in this area – a major handicap with steamers – poses no problem for the diesel-electrics.

From Africa to Alaska, G-E diesel-electrics are proving their dependability and efficiency under extreme conditions of climate and terrain. Your nearest International General Electric Company representative will be pleased to explain how G-E universal locomotives can improve your railway operations. (135-E21T)

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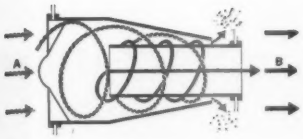
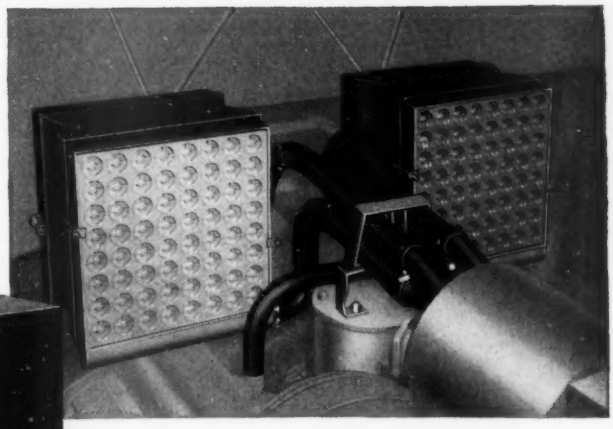
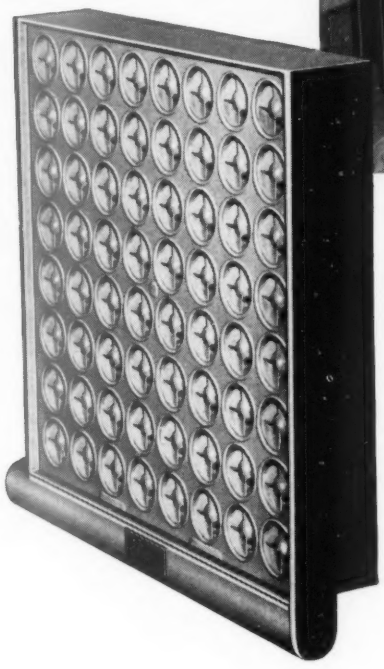


Rotonamic

air filters for DIESELS

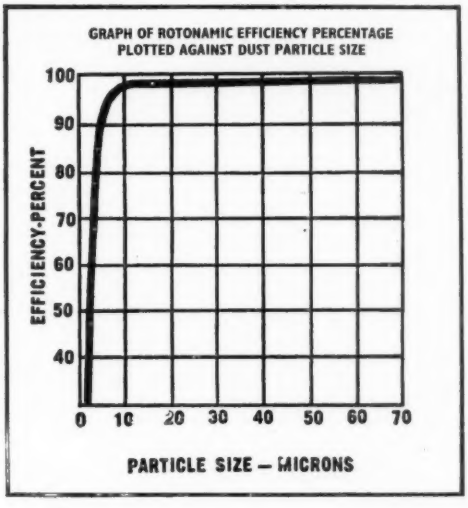
Static helical blades in the ROTONAMIC air filter give a whirling motion to the air as it enters at A. Still keeping to a helical path, the air is then induced to reverse direction, centrifuging the solids out of suspension before 90% of it is fed to the engine B. The other 10% is aspirated away with the removed solids through the tube at the base of the panel.





HIGH EFFICIENCY FILTRATION for DIESELS

Diesel life and efficiency goes up—when ROTONAMIC takes the abrasives out of the aspirated air. Road and railway transport system operators report: "periods between overhauls extended by hundreds of working hours. Greatly extended engine life".



NO MAINTENANCE and extremely high efficiency are the most important money-saving factors of ROTONAMIC air filters for diesels. Aspiration of dust particles can be provided by a simple extractor operated from the engine exhaust system. ROTONAMIC filters are made in England by INTERMIT LTD. Please write for leaflet FRC9.

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SERIES 7002 Transformer/Chokes, 5 VA. to 1500 VA.

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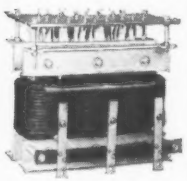

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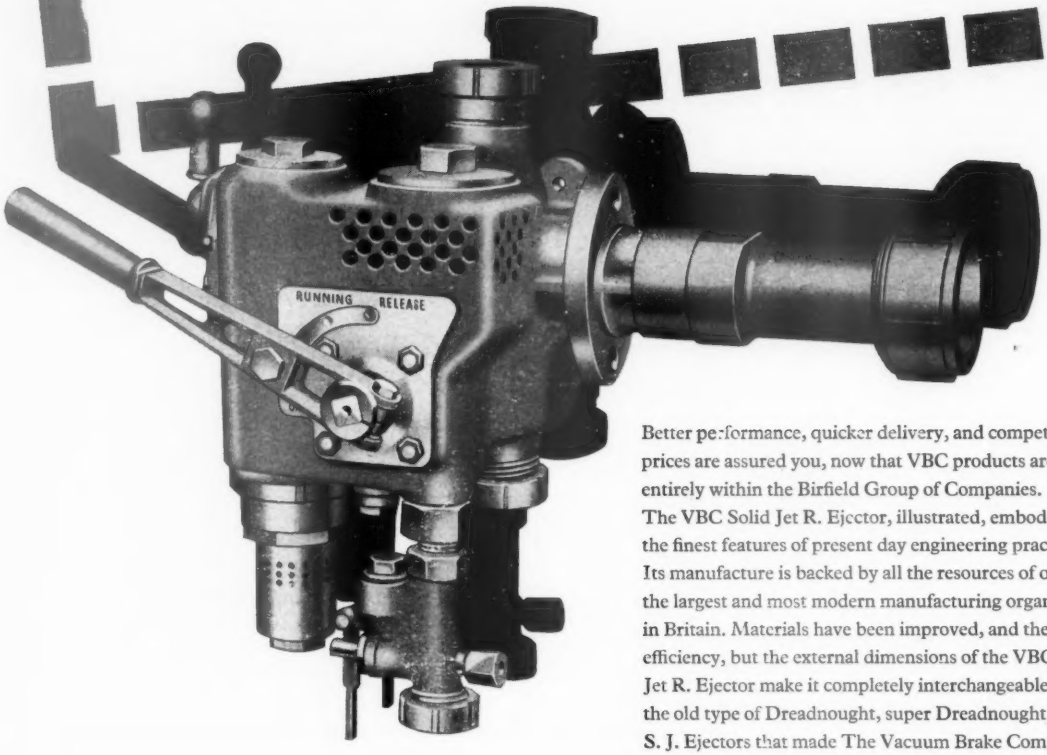

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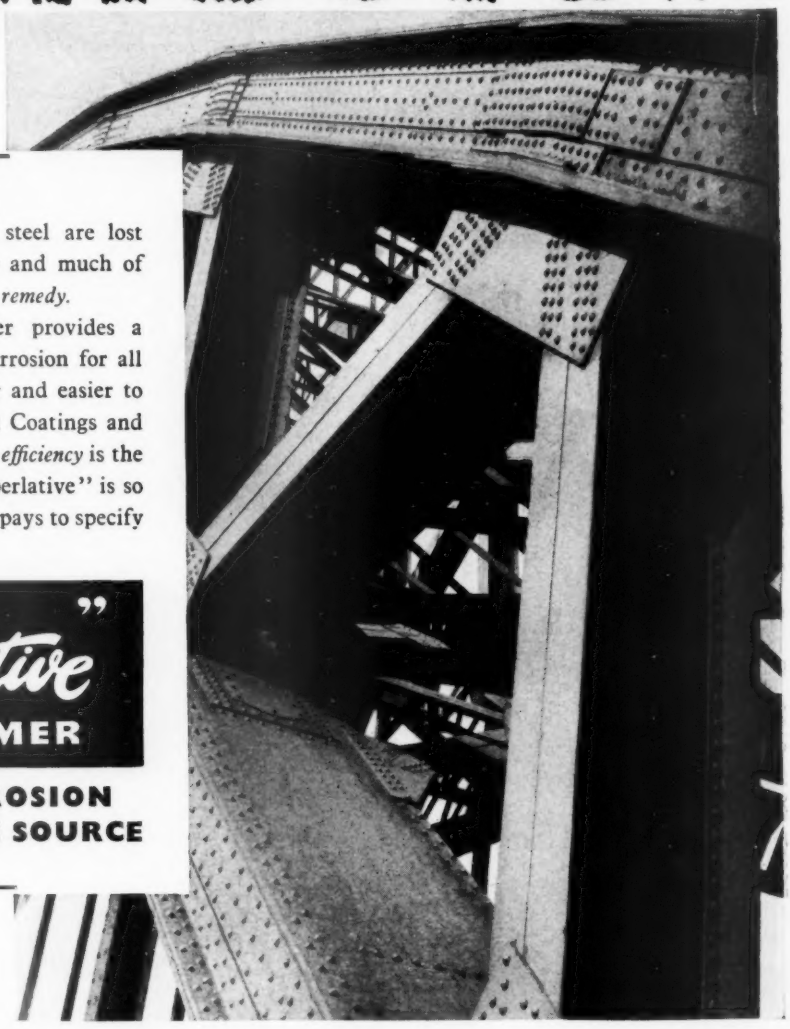

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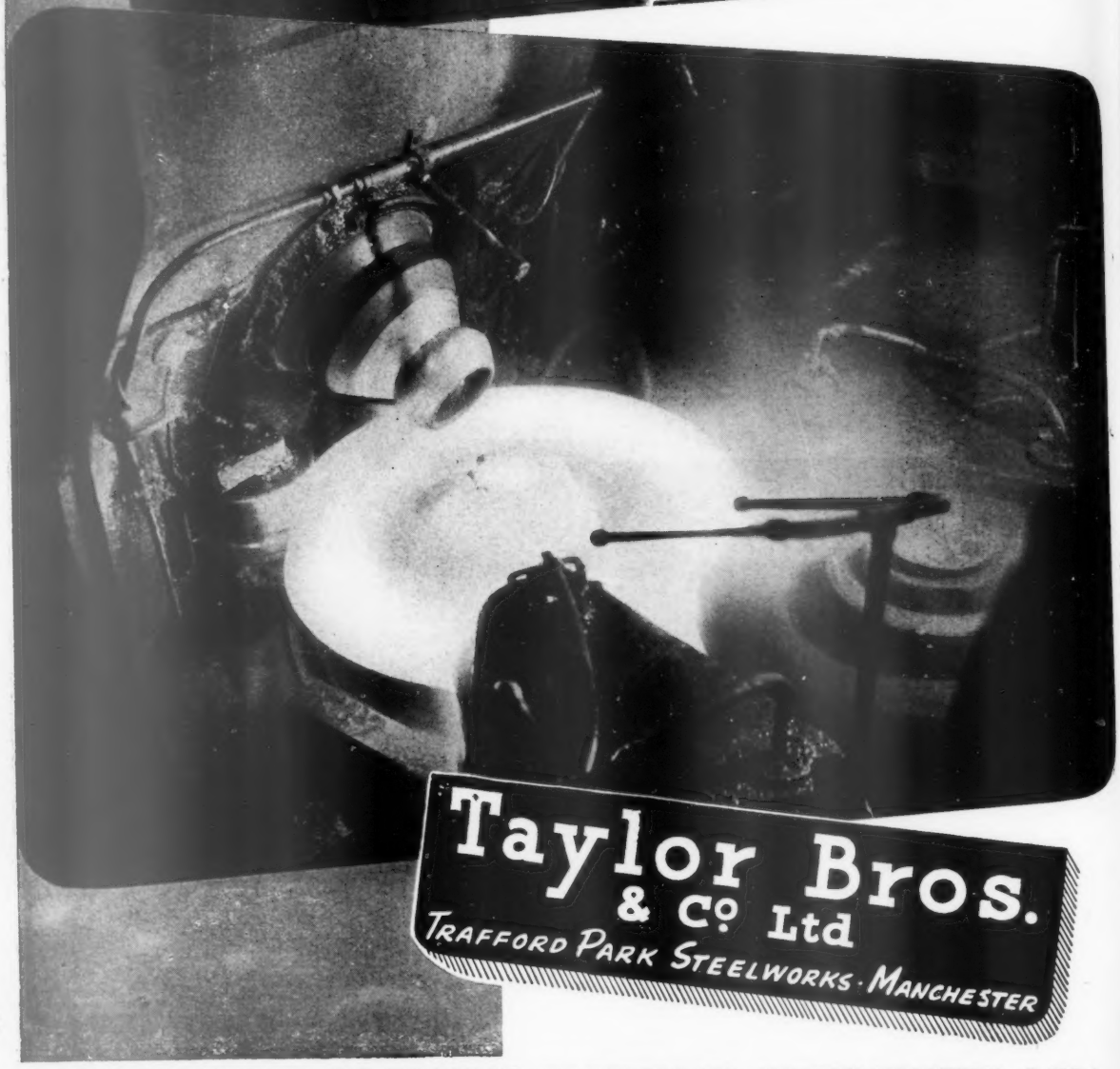

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ranging from 120 to 2200 HP · Special construction up to 4000 HP

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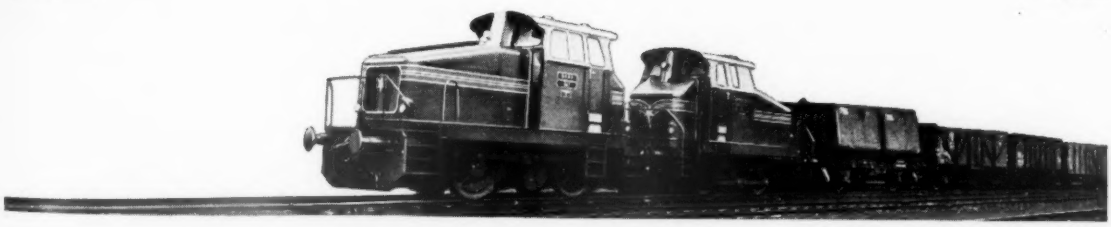

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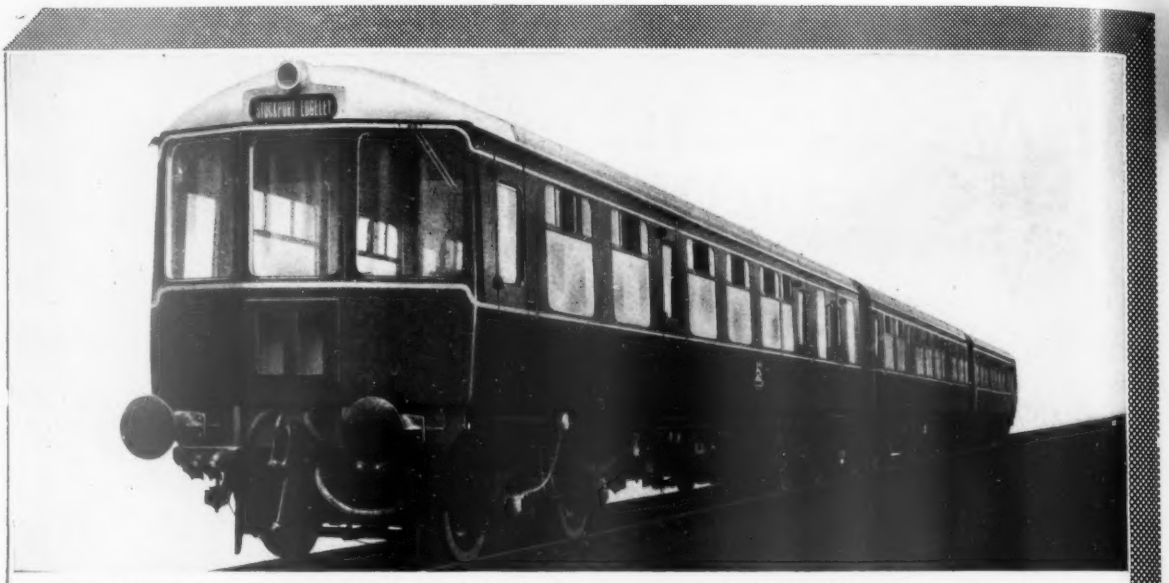

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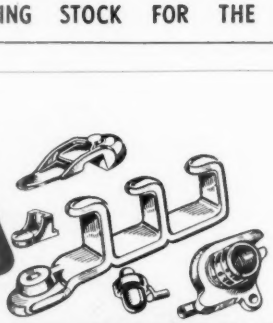

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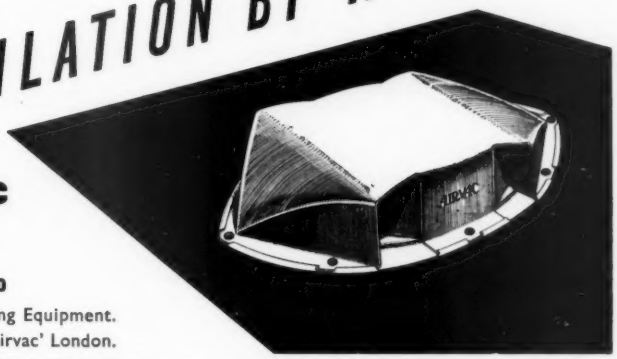

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